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Fingermath

BOOK 1

Gurau and Lieberthal

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TEACHER'S EDITION

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Fingermath

Book 1
Teachers Edition

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Fingermath Book I

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CONTENTS

Unit 1	Terminology	1
Unit 2	Counting to and from 4	17
Unit 3	Adding to 4	27
Unit 4	The 4 to 5 Exchange	39
Unit 5	Adding to 5	49
Unit 6	Counting to 9	59
Unit 7	Adding to 9	77
Unit 8	Subtracting from Minuends to 5	93
Unit 9	Subtracting from Minuends to 9	109
Unit 10	Counting by 10s to 90: Left-hand Fingerpressing	123
Unit 11	Counting to 19	131
Unit 12	Using a Pencil while Fingercounting	155
Unit 13	Adding to 14	161
Unit 14	Adding to 19	177
Unit 15	Counting by 2s and 10s	185
Unit 16	Subtracting from 14	193
Unit 17	Subtracting from 19	209
Unit 18	Counting and Pressing to 99	219
Unit 19	Adding and Subtracting to and from 99	229
Unit 20	Counting by 3s and 5s	241

Introduction to the Teacher's Edition

Fingermath is a manipulative method, ancient in origin, of performing the four basic operations of arithmetic with whole numbers. Addition, subtraction, multiplication, and division are executed by the ten fingers, which are made to represent the decimal number system not only visually, but equally through psychomotor activity and the sense of touch.

Initially, a systematic sequence of finger positions is used to count to 99. Counting can proceed beyond the initial two-hand capacity of 99 by repeating the sequence. Thus calculations are not limited to any fixed numerical boundaries.

Fingermath does not replace or supersede any other method of teaching arithmetic. Rather, it is a computational reinforcement for traditional basal programs. It focuses attention on strategies that make computation accurate, dependable, understandable, and ultimately speedy.

It would be a mistake to think that Fingermath is complicated. The broad and rapid acceptance it has met with is largely due to the exquisite simplicity of the method. The Fingermath program is equally effective for so-called average pupils, for those who may be characterized as learning disabled or handicapped, and for children with outstanding ability. The Fingermath primary program was organized to provide the flexibility needed by different teachers in a variety of classroom environments.

The manipulative techniques of Fingermath are set forth in *The Complete Book of Fingermath* (CBF). These techniques must be mastered by the teacher before they can be taught to pupils. But mastery need not be acquired in a concentrated, rapid course of study. To the contrary, a leisurely reading of CBF, with adequate practice, will provide the teacher with the necessary knowledge of the entire repertoire of Fingermath. It is recommended that the CBF be read slowly, in small portions, with regular practice. There is no need to master the entire CBF before classroom work begins.

Likewise, the greatest caution should be exercised to control the rate at which new Fingermath skills are presented to pupils. There is a tendency to race forward, assuming that the simple techniques are well established when, in fact, they require daily repetition. When in doubt about the degree of mastery of any Fingermath skill, it is useful to slow down and review. Likewise, the teacher should not encourage pupils to perform finger manipulations rapidly. It is more important to stress steady, clean, and carefully executed finger movements. Speed will develop through practice.

This Teacher's Edition (TE) is designed to present Fingermath techniques in a logical but flexible sequence of teaching units. Having learned the mechanics of each manipulation through reading the CBF, the teacher will need only the well-defined objectives detailed in this book. Both books are in loose-leaf form, so that related portions can be rearranged and combined to form a single, convenient volume. The pupil's workbook is also reproduced here so that the teacher need refer to only one volume rather than three.

Because the Fingermath school program is meant to supplement traditional classroom methods of teaching arithmetic, every effort has been made to offer to the teacher ways of adapting Fingermath activities to the prevailing basal material and methodology.

Inasmuch as basal programs vary in scope and sequence, the Fingermath curriculum has been divided into discrete objectives that, to a large degree, can be rearranged to conform to the teacher's basal preferences and needs. Because of this flexibility, there is no need to shift or otherwise alter classroom priorities.

New objectives and activities are not prescribed on a one-a-day schedule. Though they are all designed to reach specific goals, they need not be covered within any fixed period. To the contrary, it cannot be repeated too often that care should be taken not to go too fast. Teacher and pupil may be deceived by what appears to be rapid progress. Experience has shown that time must be spent, first, to develop each skill, and then to reinforce it with repeated daily practice. Otherwise, the most essential and basic techniques grow rusty or imprecise, undermining the more advanced maneuvers. *Speed of manipulative performance should always be regarded as less important than comprehension and accuracy.* Rapid finger manipulation develops gradually and naturally as a by-product of daily practice.

The teacher will soon recognize that Fingermath performance varies greatly from pupil to pupil. There are certain to be disparities among pupils with regard to readiness, comprehension, and performance. At some stage after the fundamentals have been taught in Units 1 and 2, it may be advantageous to divide the class into subgroups according to the kind of special attention they need.

For all pupils, it is more productive to conduct brief, daily Fingermath lessons than to hold longer sessions spaced days apart. Ten to fifteen minutes per day has been found to yield the best results. Although many pupils are likely to ask for more time on the subject, it is best to keep enthusiasm high by avoiding excessive classroom work and suggesting instead practice outside of the classroom.

Throughout this text, you will find suggested dialogue, or script, for particular lessons. It is recommended that those portions that deal with counting be followed verbatim. *Spend considerable time doing oral exercises.* On a regular basis, have the children keep their eyes closed so that the tactile advantage of Fingermath will be enhanced.

The verbal-motor link is a productive facet of Fingermath that cannot be overestimated. Verbalization can be an enjoyable part of the Fingermath lesson when used in a way that makes children eager for their turn. Individual verbalizing also provides a key for the teacher in recognizing the thought process used by a pupil while performing finger manipulations. Throughout the program, teachers should encourage and insist on this oral activity.

Choral counting helps to direct the thought processes of the class and makes it easy to isolate inappropriate or immature thought patterns. Pupils who may be shy about individual verbalization often will gain confidence through choral activity. As soon as children become accustomed to this activity, it is useful to have individual pupils lead the counting. This provides variety and allows the pupils to control pacing. The teacher, of course, must be thoroughly proficient in all manipulations.

For the child with special learning problems, Fingermath promises to be of considerable value. Those who have difficulty assimilating arithmetic through visual or auditory modes or both can, with Fingermath, make use of the sense of touch and the sensorimotor apparatus to learn and feel secure with arithmetical concepts. This additional pathway is helping many children not only to understand arithmetic better, but is also providing them with assurance and confidence.

On the other hand, some children who exhibit problems with fine motor coordination or left-right distinctions, for example, find the techniques of Fingermath difficult or confusing. Children with such problems may in the long run prove to be among the greatest beneficiaries of Fingermath, provided they are handled with special insight into their individual needs. They will find Fingermath only more confusing if they are pushed or chided for their slow development. Such children will need individual attention if they are to benefit from Fingermath.

If a child consistently exhibits difficulty with left-right distinctions, fine motor control, or auditory-motor coordination, the teacher should consider excusing that child from group activity with Fingermath in favor of individual training adapted in pace and format to special needs. One-on-one work with Fingermath is useful in remedying these deficits. In such cases, Fingermath has a special value: it leads not only to easier understanding of arithmetic, but coordination and confidence are fostered by slow, patient sessions.

A nationwide research program is under way to determine the best means of applying the Fingermath method to the needs of those who are learning disabled or handicapped. The program is under the direction of Dr. William E. Lamon at the Psychological Research Laboratory for Mathematics, University of Oregon, Eugene, Oregon. As special teaching materials are developed out of this program, they will be made available to schools.

The Unit Plan of Fingermath

Fingermath units comprise 99 sequentially numbered objectives in the primary program. Where necessary, a simple explanation, or synopsis, augments the obvious intent of the objective title. If any objective introduces new words or phrases, often unique to Fingermath, these are noted near the beginning of each unit.

The **Objectives** are not meant to be covered on a one-a-day basis. Each objective is developed through a number of activities. Some of these activities may require several periods of attention; others lend themselves to grouping within a single session.

New objectives should not be presented until pupils have demonstrated satisfactory performance of previously addressed skills.

Warm-ups and drills are an important part of the Fingermath program. These are useful not only to practice material already covered. Drills also help to fix in the pupil's mind the results of various simple arithmetical operations so that, in effect, the results are memorized and need not be determined anew by finger manipulations. As a teacher, you should refer frequently to the CBF in order to have a thorough grasp on the sequence of skills and manipulations. Warm-up exercises of basic skills are essential preparation for more advanced activity. The warm-up will generally provide a good indication of the pupils' readiness for new activity. If warm-ups are not performed competently, more time should be spent on review before going on to new work.

A **Basal Reference** is given for each unit. Because Fingermath activities are intended to be supplemental, the basal reference keeps the teacher aware of which basal activities are related to particular Fingermath activities.

As indicated earlier, some objectives may be repositioned in order to tie in more closely with a particular basal program. When this is done, Fingermath prerequisites must be strictly observed, to assure the teacher that new skills being presented have been supported by previous essential Fingermath work. If repositioning an objective or an entire unit requires a prerequisite that has not yet been taught, the prerequisite must be addressed first.

For example, some basal programs delay subtraction until addition to sums of 20 has been covered. Other programs introduce subtraction much earlier. Fingermath objectives can be accommodated to either program, as long as the required prerequisites are met.

Various kinds of activities are used to achieve objectives. In **Class Activities** the whole class works together, using chalkboard or other materials. Where chalkboard preparation must be made before the start of a lesson, that is indicated in the TE. Occasional use is also made of a felt board, and this also is indicated. Class activities often serve to reinforce knowledge and skills previously presented. They provide an opportunity for the verbalization that is such an important facet of Fingermath.

In **Book Activities,** the pupils use their books to address a new skill or to practice established skills. Book activities focus more on work with individual pupils than do class activities.

Game Activities further motivate pupils, especially in small groups. Almost any drill can be made more interesting by making it part of some appropriately designed game.

A variety of materials are needed for particular lessons. As an integral part of the curriculum, each pupil's book contains three types of cards: a fingerpress set showing presses from 1 to 9; a numeral set showing the numerals from 1 to 9; and a set of cards showing sets of 1 to 9. Teachers need matching sets of cards, 8½ X 11, firmly mounted. Care must be taken that pupils write their names on the back, and store their cards carefully after each use.

Finally, the objective specifications sometimes call for counters, sticks, colored yarn, and so forth, all easily obtainable as the need arises.

unit

1

Terminology

Basal Reference The pupil learns to read, write, and verbalize the numbers from 1 to 4.

*Objective 1 (TE page 3)**

The pupil will interpret the instructions "Press" and "Clear."

Class Activity 1
Book Activity 1 (page 1)**

Objective 2 (TE page 5)

The pupil can identify the right hand.

Class Activity 2
Book Activity 2 (pages 1 and 2)

Objective 3 (TE page 7)

The pupil can identify the index finger, middle finger, ring finger, and pinky.

Class Activity 3A
Class Activity 3B
Book Activity 3A (page 3)
Book Activity 3B (page 4)

Objective 4 (TE page 10)

The pupil can hold the hands in the ready, suspended position for Fingermath and can press and clear each of the fingers of the right hand when instructed to do so by having them called by name (index finger, middle finger, ring finger, pinky).

Book Activity 4 (page 1)

Objective 5 (TE page 12)

The pupil, on command, can press, read, and clear one, two, three, and four fingers.

Class Activity 5A
Class Activity 5B
Book Activity 5 (page 5)

Objective 6 (TE page 14)

The pupil, on command, can clear the pinky, ring, middle, and index fingers, one at a time, counting off how many fingers are being cleared.

Class Activity 6

Objective 7 (TE page 15)

The pupil can press and clear the finger values from 1 to 4 and read the fingers. The pupil will not curl the fingers, or manipulate out of sequence.

Class Activity 7

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 1

The pupil will interpret the instructions "Press" and "Clear."

Synopsis

The terms *press* and *clear* are in common use in the operation of electronic calculators. Since these terms will be in continual use by the children in class throughout their work with Fingermath, they should be mastered at the outset.

Special attention should be paid to the way the children hold their hands. They should be extended in a relaxed, arched position. Unpressed fingers should not be curled under but always ready for action. Good position is the same as would be assumed to play the piano or operate a typewriter. (See *The Complete Book of Fingermath,* pages 9 and 10.)

Draw on the children's own experiences to help make the terms *press* and *clear* easy to grasp.

Materials: A small selection of counting objects (such as centimeter cubes, buttons, small stones) to be used by the teacher.

Class Activity 1

a. Press

I AM GOING TO READ A SENTENCE TO YOU. "FREDDY PRESSED HIS NOSE AGAINST THE STORE WINDOW." CAN SOMEONE SHOW US WHAT FREDDY DID?

I WOULD LIKE SOMEONE TO SHOW US HOW HE OR SHE MIGHT PRESS A HAND, FOR INSTANCE, AGAINST THE BOARD.

CAN ANYONE ELSE SHOW US HOW TO PRESS A HAND OR THE NOSE AGAINST THE WALL?

Let the class tell of experiences and examples of pressing activities.

b. Clear

WHAT WOULD YOUR MOTHER BE ASKING YOU TO DO IF SHE SAID TO YOU, "HELP ME TO CLEAR THE DISHES OUT OF THE SINK"? WHAT HAPPENS WHEN WE *CLEAR* THE TABLE? Dishes are removed; they are taken away; they are not there any more; they are gone; etc.

Put the selection of counters on an empty desk.

I NEED A VOLUNTEER WHO CAN SHOW US WHAT TO DO WHEN I SAY "CLEAR THESE BUTTONS FROM THE DESK."

Let the class tell of experiences and give examples of clearing activities.

Book Activity 1
(page 1)

OPEN YOUR FINGERMATH BOOKS TO PAGE 1.

EVERYONE HOLD YOUR HAND OVER THE PICTURE OF THE HAND. BE SURE TO USE THE SAME HAND AS YOU SEE IN THE PICTURE. PLACE YOUR PINKY ON THE PICTURE OF THE PINKY. PLACE YOUR THUMB ON THE PICTURE OF THE THUMB. DO THE SAME THING WITH YOUR OTHER FINGERS.

PRESS ALL YOUR FINGERS ONTO THE FINGERS OF THE HAND ON THAT PAGE.

All five fingers should be pressed to the five fingers on the page. If possible, see to it that the hand is arched and the fingers touch firmly. The hand should not be pointing down at the page, but be almost parallel to it. Don't let children curl the fingers into a partial fist.

VERY GOOD . . . NOW EVERYONE CLEAR YOUR FINGERS FROM THE PAGE.

The children should remove their fingers from the page.

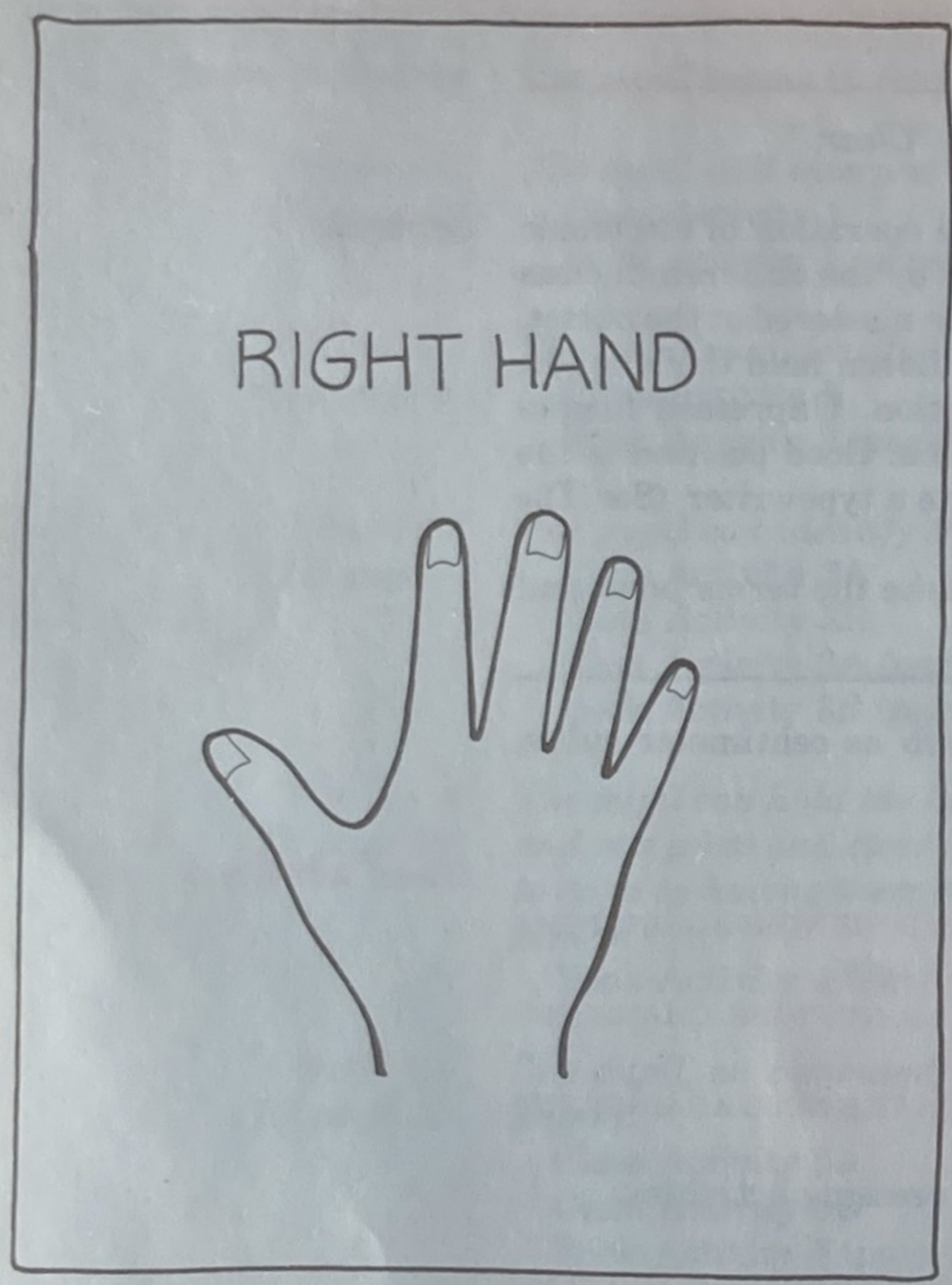
LET'S TRY THAT AGAIN.

PRESS YOUR FINGERS.

CLEAR YOUR FINGERS.

PRESS YOUR FINGERS.

CLEAR YOUR FINGERS.


RIGHT HAND

OBJECTIVE 2

The pupil can identify the right hand.

Synopsis

This lesson is useful in preparing children for working with the right hand. Since it is not unusual for children of this age to confuse left and right, time must be spent on left-right-oriented activities.

Warm-up

Pressing and clearing fingers on command.

Class Activity 2

Materials: Knitting wool or string.
Board:

Make an actual-size tracing of your right hand.

Have one child at a time come to the front of the room. Tie a piece of yarn around each one's right wrist. Interview each child briefly before the class as to what kind of things are done with that hand (shake hands, brush hair, throw ball, etc.). Throughout the day, occasionally call out "Raise your right hand," and check to see who is still unsure.

Teach the following poem to the class, using appropriate hand motions:

Left Hand, Right Hand

This is my right hand, with its colored yarn;
This is my left hand, on the other arm.
Right hand, left hand, roll them around;
Left hand, right hand, pound, pound, pound.*

Warm-up

The poem: Left Hand, Right Hand.

Book Activity 2
(pages 1 and 2)

OPEN YOUR FINGERMATH BOOKS TO PAGE 1. LOOK AT THE HAND. THE HAND IS THE RIGHT HAND. PRESS THE FINGERS OF *YOUR* RIGHT HAND ONTO THE HAND IN THE PICTURE. WHICH OF YOUR HANDS IS ON THE PICTURE? The right hand.

EVERYONE RAISE YOUR LEFT HAND.

WHICH HAND IS RAISED? The left hand.

CLEAR YOUR FINGERS.

ONCE AGAIN, PRESS THE FINGERS OF YOUR RIGHT HAND TO THE PICTURE.

CLEAR YOUR FINGERS.

NOW TURN TO PAGE 2.

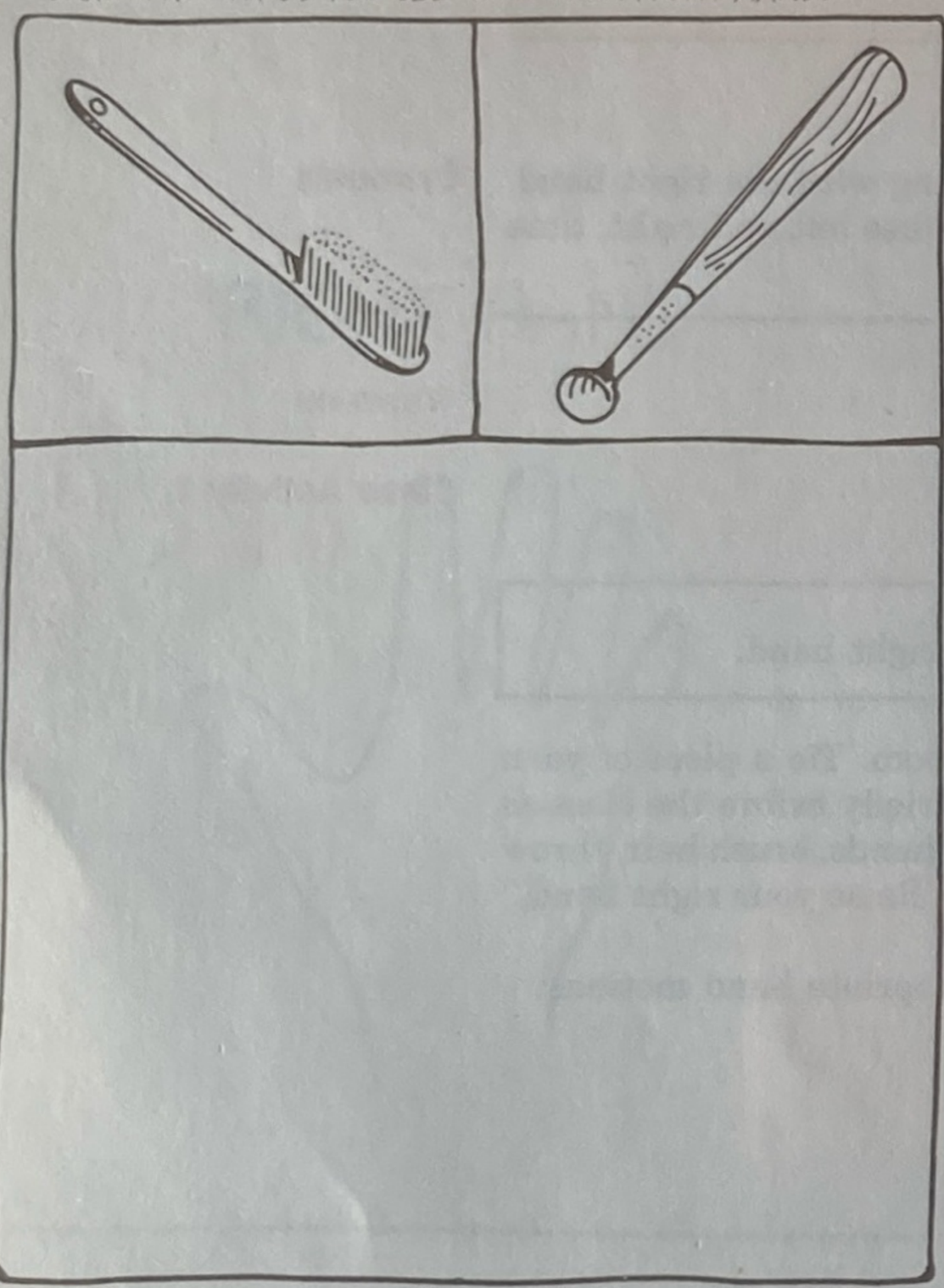
I WANT YOU TO THINK ABOUT THINGS THAT YOU DO ESPECIALLY WITH YOUR RIGHT HAND. SOME OF YOU BRUSH YOUR TEETH WITH YOUR RIGHT HAND, OR YOU EAT YOUR FOOD WITH YOUR RIGHT HAND. Listen to suggestions that the children have.

I WANT YOU TO DRAW A PICTURE OF SOME OF THE THINGS YOU USE WITH YOUR RIGHT HAND.

---

*Adapted from *Counting Rhymes and Finger Play,* compiled by Jessie Meese, Betty Holden, and Tommie West. A monograph published by The National Leadership Conference on Mathematics for Young Children.

DRAW TWO THINGS YOU USE WITH YOUR RIGHT HAND.



2

OBJECTIVE 3

The pupil can identify the index finger, middle finger, ring finger, and pinky.

Synopsis

Be certain to spend sufficient time to establish finger recognition, as future pressing in proper sequence is based on this knowledge.

Vocabulary

Index finger, middle finger, ring finger, pinky

Warm-up

Pressing and clearing with the right hand.
Poem: Left Hand, Right Hand.

Class Activity 3A

Hold up your right hand and wiggle your index finger.

DOES ANYONE KNOW THE NAME OF THIS FINGER?

The answers will vary, including probably forefinger, pointy finger, pointing finger. If index finger is not mentioned, mention it.

WE CALL IT THE INDEX FINGER. EVERYONE SAY "INDEX FINGER." WE USE IT TO POINT WITH. Demonstrate.

EVERYONE RAISE YOUR RIGHT HAND. NOW, WITH YOUR OTHER HAND, POINT TO YOUR INDEX FINGER. Demonstrate.

WHICH FINGER ON YOUR OTHER HAND DID YOU POINT WITH?

The index finger.

Use a similar procedure to identify the middle finger, the ring finger, and the pinky.

Finger songs should be a recurring activity. Have the class learn this song. Use it for as many lessons as finger naming is discussed.

Finger Song
(Sung to the tune of "Frère Jacques")

Action	*Words*
Hold both hands behind back.	Where is index? Where is index?
Bring right hand out with index finger out.	Here I am. Here I am.
Wiggle index finger.	How are you today, sir? Very well, I thank you.
Put hands behind back again.	Run away. Run away.

(Repeat for each of the other fingers.)

Class Activity 3B

Begin by pressing one, two, three, or four fingers against the chalkboard in Fingermath combinations: index finger only; index and middle finger only; index, middle, and ring finger only; index, middle, ring finger, and pinky only. Then tell the class to press the same fingers at the same time you call out the name of each finger. Run through the four possibilities at least twice. Indicate to the class that they can see which fingers to press by the fingers you press. This will begin to help them make the connection between fingerpressing and numeration. (The connection will be made overt in Unit 2, Objective 9.) For variety have the children pair off facing each other and have one child lead the other through the four possibilities. Then have them reverse roles.

Book Activity 3A (page 3)

OPEN YOUR FINGERMATH BOOKS TO PAGE 3. LOOK AT THE BOX WITH THE STAR IN THE CORNER. WITHOUT CALLING OUT, THINK OF THE NAME OF THE FINGER THAT IS COLORED IN. RAISE YOUR HAND IF YOU KNOW THE NAME. Index finger.

Go through the rest of the fingers in the same way.

Book Activity 3B (page 4)

TAKE OUT A CRAYON AND TURN TO PAGE 4 IN YOUR FINGERMATH BOOK.

LOOK AT THE BOX WITH THE STAR IN THE CORNER. COLOR IN THE RING FINGER ON THE HAND. Wait.

NOW LOOK AT THE BOX WITH THE CIRCLE IN THE CORNER. COLOR IN THE PINKY. Wait.

NOW LOOK AT THE BOX WITH THE SQUARE IN THE CORNER. COLOR IN THE MIDDLE FINGER. Wait.

NOW LOOK AT THE BOX WITH THE TRIANGLE IN THE CORNER. COLOR IN THE INDEX FINGER. Wait.

NOW FIND A LEFT HAND. COLOR IN THE INDEX AND MIDDLE FINGER. Wait.

FIND A RIGHT HAND. COLOR IN THE INDEX, MIDDLE, RING, AND PINKY. Wait.

FIND A LEFT HAND. COLOR IN THE INDEX, MIDDLE, AND RING FINGER. Wait.

FIND A LEFT HAND. COLOR IN THE INDEX. Wait.

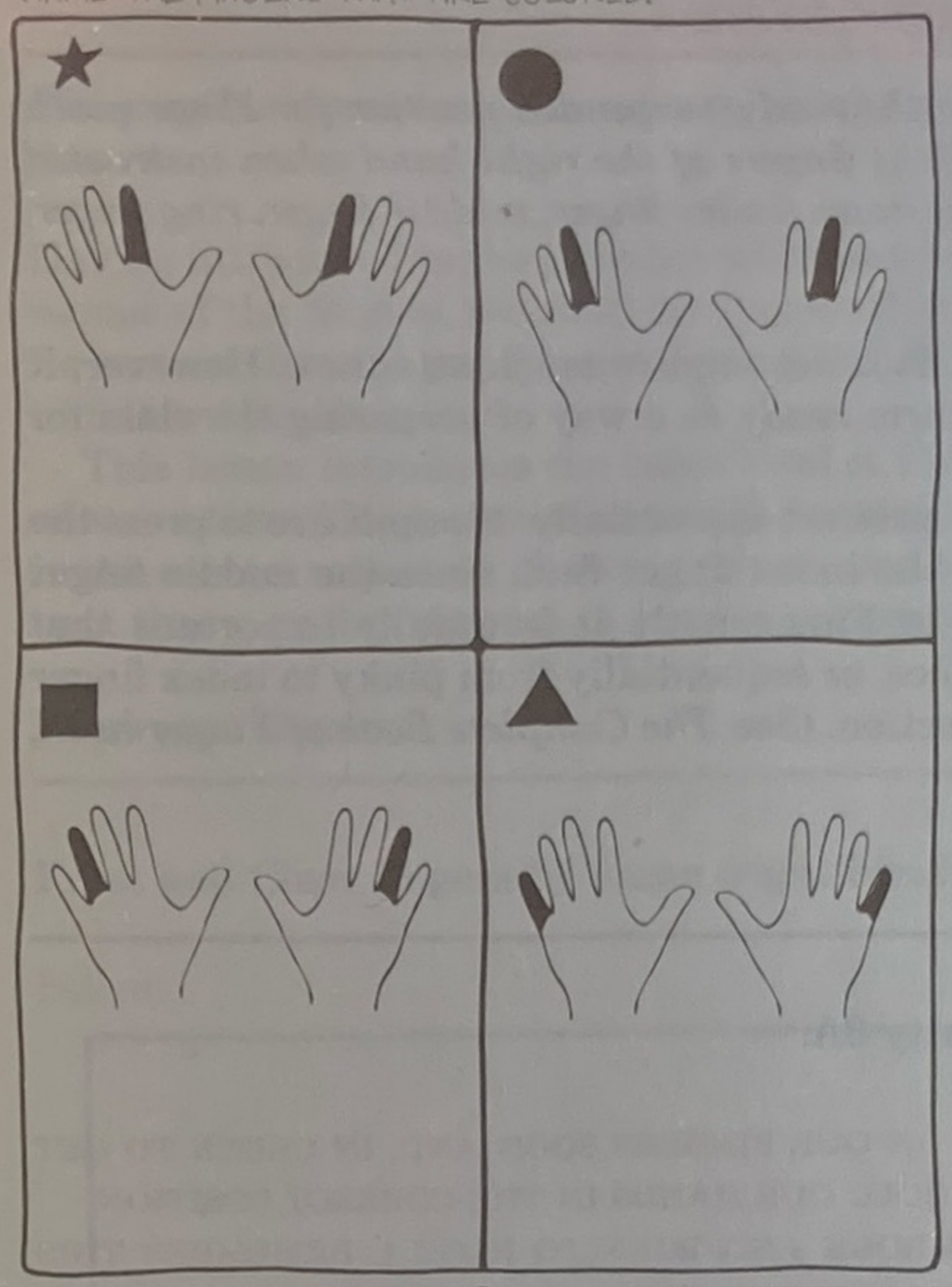
FIND A RIGHT HAND. COLOR IN THE INDEX, MIDDLE, AND RING FINGER. Wait.

FIND A LEFT HAND. COLOR IN THE INDEX, MIDDLE, RING, AND PINKY. Wait.

FIND A RIGHT HAND. COLOR IN THE INDEX FINGER. Wait.

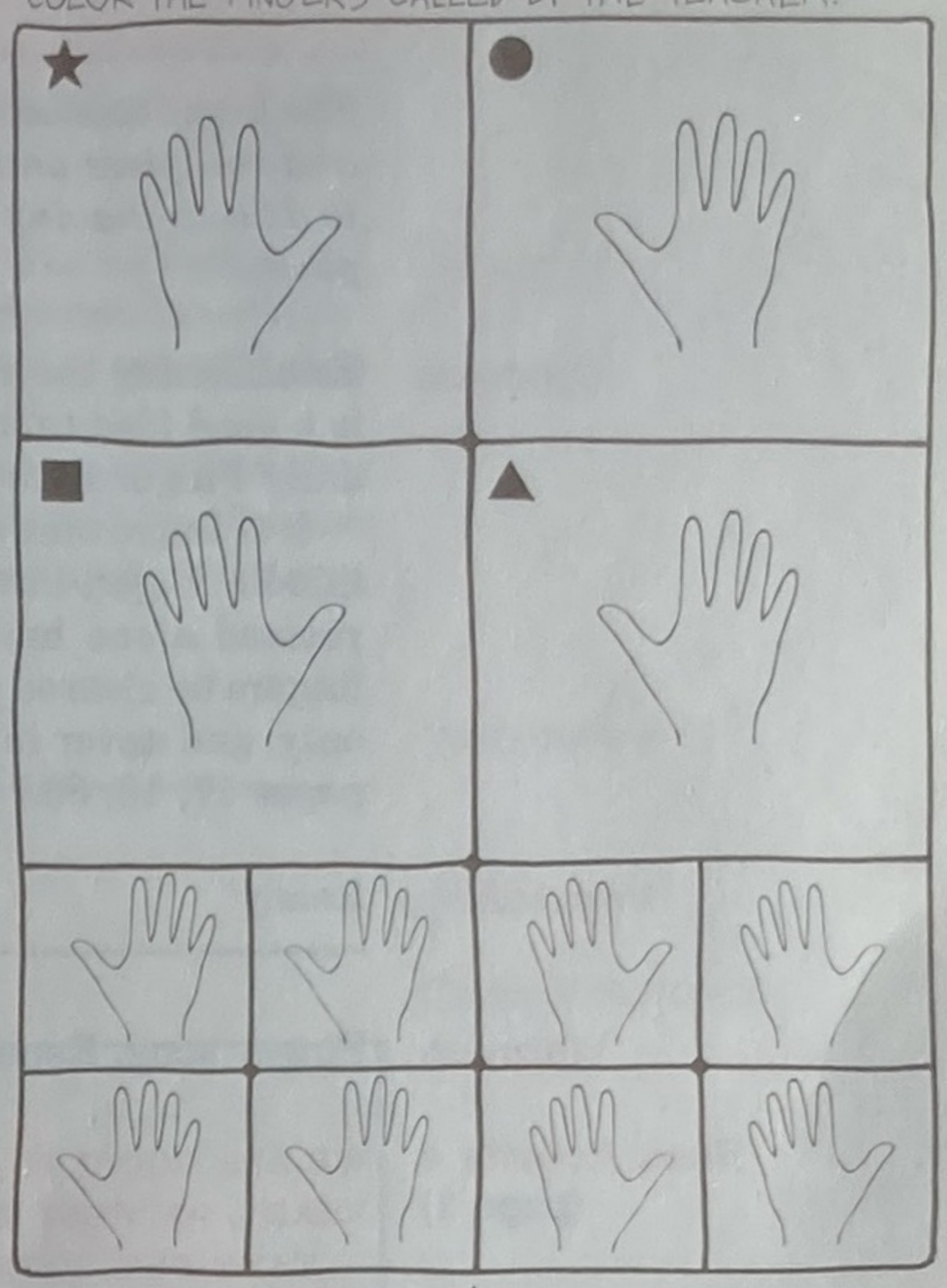
FIND A RIGHT HAND. COLOR IN THE INDEX AND MIDDLE FINGER. Wait.

NAME THE FINGERS THAT ARE COLORED.



3

COLOR THE FINGERS CALLED BY THE TEACHER.



4

OBJECTIVE 4

The pupil can hold the hands in the ready, suspended position for Fingermath and can press and clear each of the fingers of the right hand when instructed to do so by having them called by name (index finger, middle finger, ring finger, pinky).

Synopsis Establishing the ready position does not require much attention. However, it is a good idea to introduce the term *ready* as a way of preparing the class for daily Fingermath work.

It is important that fingers be pressed sequentially. If pupils are to press the middle finger, have them press the index finger first, since the middle finger pressed alone has no meaning in Fingermath. It is equally important that fingers be cleared either all at once, or sequentially from pinky to index finger only, and never in the other direction. (See *The Complete Book of Fingermath,* pages 17, 18, 80.)

Vocabulary Ready

Warm-up Finger song. Repeat Class Activity 3A.

Book Activity 4 (page 1) WE ARE GOING TO BE COUNTING ON OUR FINGERS SOON AND, IN ORDER TO GET READY, WE MUST KNOW HOW TO HOLD OUR HANDS IN THE CORRECT POSITION.

TAKE OUT YOUR FINGERMATH BOOK AND TURN TO PAGE 1. REMEMBER THIS PICTURE OF THE RIGHT HAND? I WANT YOU TO HOLD YOUR RIGHT HAND OVER THE RIGHT-HAND PICTURE ON THE PAGE, LIKE THIS. Demonstrate by suspending your right hand about one inch above the page and parallel to it. After demonstrating, go around and correct improper positions. As you go through this next part, walk around the room and correct children as they follow your directions.

FINGERS READY. PRESS YOUR INDEX FINGER.

CLEAR YOUR INDEX FINGER.

FINGERS READY. PRESS YOUR INDEX FINGER. NOW KEEP YOUR INDEX FINGER PRESSED AND ALSO PRESS YOUR MIDDLE FINGER. It is not unusual for children to curl the remaining fingers under. This must be discouraged, since all fingers should always be free and ready for action.

CLEAR YOUR MIDDLE FINGER ONLY.

NOW CLEAR YOUR INDEX FINGER. SEE! YOUR FINGERS ARE ALL CLEAR. ONCE AGAIN, NOW.

FINGERS READY. PRESS YOUR INDEX FINGER; NOW PRESS YOUR MIDDLE FINGER; NOW PRESS YOUR RING FINGER. PAY ATTENTION, EVERYONE. I WANT YOU TO CLEAR ONLY THE FINGER I TELL YOU TO CLEAR.

CLEAR YOUR RING FINGER; CLEAR YOUR MIDDLE FINGER; CLEAR YOUR INDEX FINGER. NOW YOUR FINGERS ARE ALL CLEAR.

ONCE AGAIN. FINGERS READY. PRESS YOUR INDEX FINGER; PRESS YOUR MIDDLE FINGERS; PRESS YOUR RING FINGER; PRESS YOUR PINKY. NOW CLEAR YOUR PINKY; CLEAR YOUR RING FINGER; CLEAR YOUR MIDDLE FINGER; CLEAR YOUR INDEX FINGER. Go through the above pattern twice more, now having the children call out the name of each finger as it is pressed.

This is an essential exercise, teaching the pupil how to press one finger at a time and how to clear one finger at a time. It will become part of the daily warm-up.

OBJECTIVE 5

The pupil, on command, can press, read, and clear one, two, three, and four fingers.

Synopsis

Having introduced in the previous unit the terms *press* and *clear* as well as the names of the fingers, we shall now apply these terms to Fingermath activity. Be certain that the pupil is not getting lost in the verbiage but is actually able to follow the directions.

This lesson introduces the basic level of Fingermath: pressing the numbers one at a time. The lesson stresses (1) pressing one, two, three, and four fingers in the correct sequence; (2) being able to read one's fingers; and (3) clearing one, two, three, or four fingers in correct sequence.

Vocabulary

Read your fingers

Warm-up

Press and Clear fingers by name (right hand).

Class Activity 5A

Board:

* * * * * * * * * *

Have volunteers come to the board and circle in turn: one, two, three, and four stars.

Class Activity 5B

HOLD THE FINGERS OF YOUR RIGHT HAND IN THE READY POSITION.

PRESS YOUR INDEX FINGER. HOW MANY FINGERS ARE YOU PRESSING? One.

KEEP IT PRESSED. NOW PRESS YOUR MIDDLE FINGER ALSO. KEEP BOTH FINGERS DOWN. HOW MANY FINGERS ARE YOU PRESSING NOW? Two.

NOW ALSO PRESS YOUR RING FINGER. HOW MANY FINGERS ARE YOU PRESSING NOW? Three.

PRESS YOUR PINKY. NOW HOW MANY FINGERS ARE YOU PRESSING? Four.

FROM NOW ON, WHENEVER I SAY "READ YOUR FINGERS" I WANT YOU TO TELL ME IN A CLEAR VOICE HOW MANY FINGERS YOU ARE PRESSING. READ YOUR FINGERS. Four.

CLEAR YOUR PINKY. Observe and correct any children who have improperly cleared. READ YOUR FINGERS. Three.

CLEAR YOUR RING FINGER. READ YOUR FINGERS. Two.

CLEAR YOUR MIDDLE FINGER. READ YOUR FINGERS. One. CLEAR YOUR INDEX FINGER. READ YOUR FINGERS. None. Zero. Nothing.

I WANT YOU TO SAY "ZERO" WHEN NO FINGERS ARE PRESSED. SAY IT. Zero.

WHAT DO I WANT YOU TO DO WHEN I SAY "READ YOUR FINGERS"? Tell the teacher the number of fingers I am pressing.

Book Activity 5
(page 5)

OK, LET'S START AGAIN. CLEAR YOUR FINGERS. READY? NOW, PRESS YOUR INDEX FINGER. READ YOUR FINGERS. One.

CLEAR YOUR INDEX FINGER. READ YOUR FINGERS. Zero.

SAY "ZERO" WHEN NO FINGERS ARE PRESSED. SAY IT.

NOW PRESS YOUR INDEX FINGER. PRESS YOUR MIDDLE FINGER. PRESS YOUR RING FINGER. PRESS YOUR PINKY. READ YOUR FINGERS. Four.

NOW, LISTEN CAREFULLY. CLEAR YOUR PINKY. CLEAR YOUR RING FINGER. CLEAR YOUR MIDDLE FINGER. CLEAR YOUR INDEX FINGER. READ YOUR FINGERS. Zero.

Continue this mode of practice, having the class read their fingers at various press and clear positions.

For this activity, nothing is to be written in the book.

OPEN YOUR FINGERMATH BOOKS TO PAGE 5.

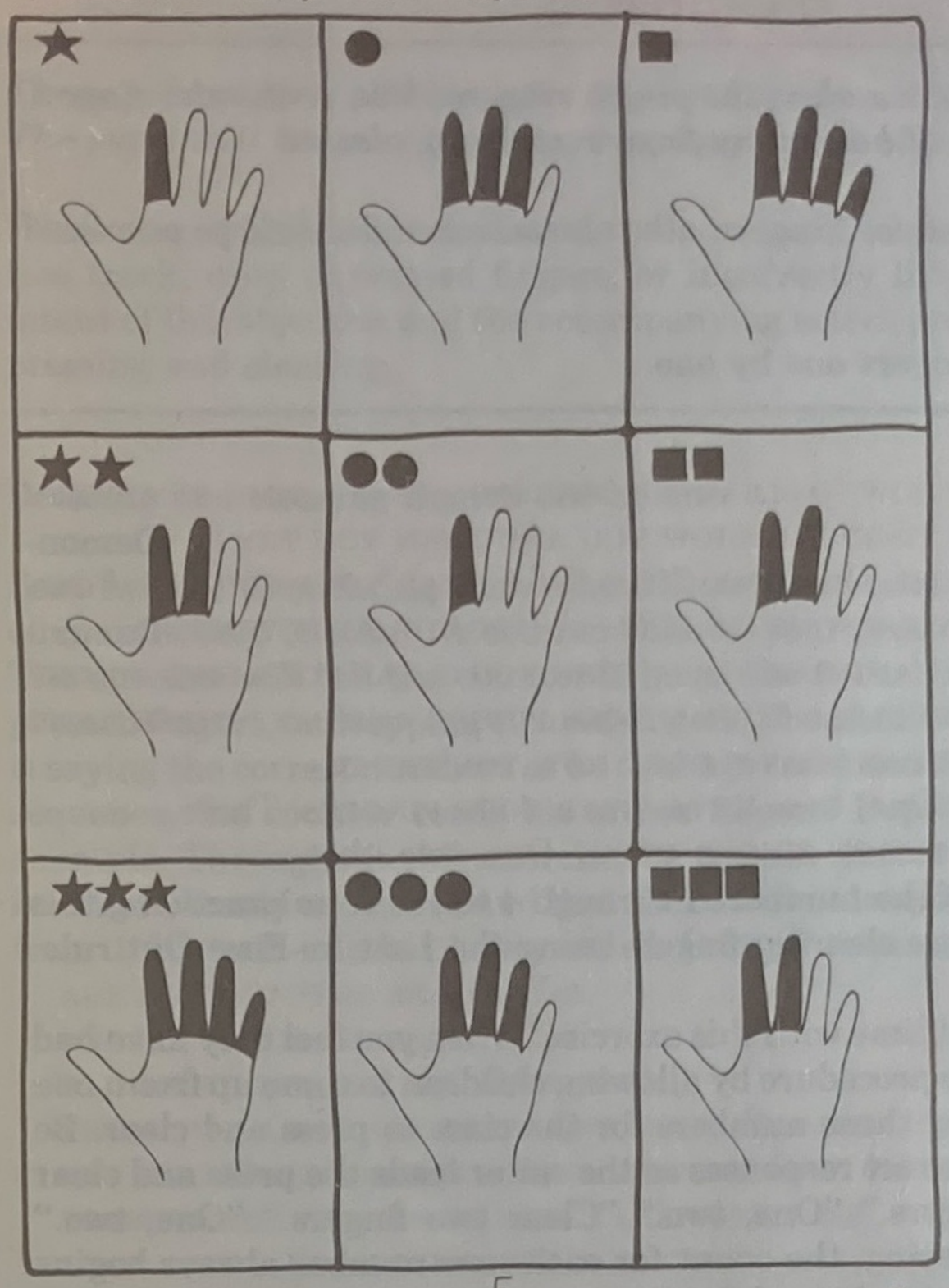
LOOK AT THE BOX WITH THE STAR IN THE CORNER. WHICH FINGER IS PRESSED? The index finger.

PRESS YOUR OWN INDEX FINGER. READ YOUR FINGERS. HOW MANY? One.

CLEAR YOUR INDEX FINGER.

READ YOUR FINGERS. Zero. Continue with the remaining boxes on the page in the same way.

PRESS AND READ YOUR FINGERS.



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OBJECTIVE 6

The pupil, on command, can clear the pinky, ring, middle, and index fingers, one at a time, counting off how many fingers are being cleared.

Synopsis This objective is important for Fingermath subtraction and should be practiced often.

Warm-up Pressing and clearing fingers one by one.

Class Activity 6 TODAY WE WILL PRACTICE HOW TO CLEAR OUR FINGERS ONE AT A TIME. REMEMBER HOW WE DID IT THE LAST TIME? I'LL SHOW YOU AND THEN YOU TRY IT. (Demonstrate) PRESS FOUR FINGERS. One, two, three, four. READ YOUR FINGERS. Four. NOW WHEN I SAY "CLEAR YOUR FOUR FINGERS," YOU DO THE FOLLOWING. (Demonstrate) CLEAR YOUR PINKY AND SAY "ONE." THEN YOU CLEAR YOUR RING FINGER AND SAY "TWO." THEN YOU CLEAR YOUR MIDDLE FINGER AND SAY "THREE." AND CLEAR YOUR INDEX FINGER AND SAY "FOUR." NOW YOU TRY IT.

PRESS THREE FINGERS. One, two, three. READ YOUR FINGERS. Three.

NOW CLEAR AND COUNT EACH FINGER. BEGIN. One, two, three.

Use a random order of the numbers 1 through 4 to continue practicing this skill. Be certain pupils are clearing fingers using the Last In–First Out rule. (See CBF page 80.)

Give the class plenty of time with this exercise. When you feel they have had enough practice, vary the procedure by allowing children to come up front, one at a time, and call two or three numbers for the class to press and clear. Be certain they make the correct responses as the caller leads the press and clear activity: "Press two fingers." "One, two." "Clear two fingers." "One, two." Whether pressing or clearing, the count for each new number always begins with "One." (See CBF pages 21 and 79.)

OBJECTIVE 7

The pupil can press and clear the finger values from 1 to 4 and read the fingers. The pupil will not curl the fingers or manipulate out of sequence.

Synopsis

While some pupils can concentrate on a series of sequential directions, others lose track, drop unpressed fingers, or incorrectly lift pressed ones. It is the intent of this objective and the accompanying activity to focus on correct finger pressing and clearing.

Warm-up

Pressing and clearing fingers one by one.

Class Activity 7

Seat two children facing each other. Have them take turns playing the roles of counter and checker. A counter follows your press and clear instructions. The checker will tell the counter if he or she is curling fingers under, lifting pressed fingers, or dropping cleared fingers. The checker also sees if the counter is saying the correct numbers as he or she presses and clears. At the end of each sequence, the counter reads his or her fingers. Pupils swap roles after each example. Throughout this exercise, be certain that only one finger at a time is either pressed or cleared and that the counter always begins a new unit count from 1 for each number being called. Pair off teams of children.

ARE MY COUNTERS READY? Yes.

ARE MY CHECKERS READY? Yes.

ALL RIGHT, EVERYBODY. HERE WE GO.

PRESS TWO. One, two. PRESS ONE MORE. One. READ YOUR FINGERS. Three. CLEAR TWO. One, two. READ YOUR FINGERS. One. CLEAR YOUR FINGERS.

PRESS THREE. One, two, three. CLEAR ONE. One. PRESS TWO. One, two. READ YOUR FINGERS. Four. CLEAR YOUR FINGERS.

PRESS FOUR. One, two, three, four. CLEAR THREE. One, two, three. PRESS TWO. One, two. READ YOUR FINGERS. Three. CLEAR YOUR FINGERS.

PRESS TWO. One, two. PRESS TWO MORE. One, two. CLEAR ONE. One. READ YOUR FINGERS. Three. CLEAR YOUR FINGERS.

PRESS THREE. One, two, three. CLEAR TWO. One, two. PRESS ONE. One. READ YOUR FINGERS. Two. CLEAR YOUR FINGERS.

PRESS FOUR. One, two, three, four. CLEAR TWO. One, two. CLEAR ONE. One. READ YOUR FINGERS. One. CLEAR YOUR FINGERS.

PRESS ONE. One. PRESS THREE MORE. One, two, three. CLEAR TWO. One, two. READ YOUR FINGERS. Two. CLEAR YOUR FINGERS.

PRESS TWO. One, two. PRESS ONE MORE. One. CLEAR THREE. One, two, three. READ YOUR FINGERS. Zero. CLEAR YOUR FINGERS. They are clear already.

PRESS THREE. One, two, three. CLEAR TWO. One, two. PRESS ONE. One. READ YOUR FINGERS. Two. CLEAR YOUR FINGERS.

PRESS FOUR. One, two, three, four. CLEAR TWO. One, two. PRESS ONE. One. READ YOUR FINGERS. Three. CLEAR YOUR FINGERS.

PRESS ONE. One. PRESS TWO MORE. One, two. PRESS ONE. One. READ YOUR FINGERS. Four. CLEAR YOUR FINGERS.

unit

2

Counting to and from 4

Basal Reference This unit presupposes that pupils

1. Have had many opportunities to handle physical counting objects.
2. Can count by rote to 10 or higher.
3. Can match sets of objects to numerals to 4.
4. Can order sets of objects in a sequence to 4.
5. Can count a set of as many as four objects.
6. Can demonstrate the ability to recognize that the quantity of a set of counters is not affected by the position of the counters.

All of these abilities are typically covered in the initial chapter of a basal text.

Fingermath Prerequisite Unit 1

*Objective 8 (TE page 19)** *The pupil can match the number of fingers pressed to the quantity represented in a set.*

Book Activity 8A (page 6)**
Book Activity 8B (page 7)

Objective 9 (TE page 21) *The pupil can press, read, and clear the first four basic finger positions when they are identified numerically and will count aloud as each finger is pressed or cleared.*

Class Activity 9
Game Activity 9A
Game Activity 9B

Objective 10 (TE page 23) *The pupil can press the correct finger combinations for designated numerals and correctly mark the diagrams.*

Book Activity 10A (page 8)
Book Activity 10B (page 9)

Objective 11 (TE page 24) *The pupil can identify the numeral represented by the fingerpress shown on an illustrated finger model.*

Book Activity 11A (page 10)
Book Activity 11B (page 11)

Objective 12 (TE page 25) *The pupil can direct press the numbers 0 through 4.*

Class Activity 12

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 8

The pupil can match the number of fingers pressed to the quantity represented in a set.

Synopsis

This lesson links the pupil's fingerpressing activity to the developing concept of quantity. Observe how readily this occurs with each learner.

It is important not to rush ahead to the following objective until the child shows a clear comprehension of the quantitative significance of fingerpressing.

Warm-up

Pressing and clearing fingers one by one to 4.

Book Activity 8a
(page 6)

Materials: Crayons

Board: Picture of the hand, colored in as in the book, page 6, top left-hand corner.

TAKE OUT YOUR CRAYONS AND TURN TO PAGE 6. LOOK AT THE BOX WITH THE STAR IN THE CORNER. WHICH FINGER IS PRESSED? The index finger.
HOW MANY FINGERS ARE PRESSED IN THE PICTURE? One.
PRESS ONE. One. CLEAR YOUR FINGERS.

NOW LOOK AT THE LITTLE CIRCLES AT THE BOTTOM OF THAT PICTURE. Demonstrate with the model on the board. USE YOUR CRAYON TO COLOR IN ONE CIRCLE BECAUSE ONE FINGER WAS PRESSED.

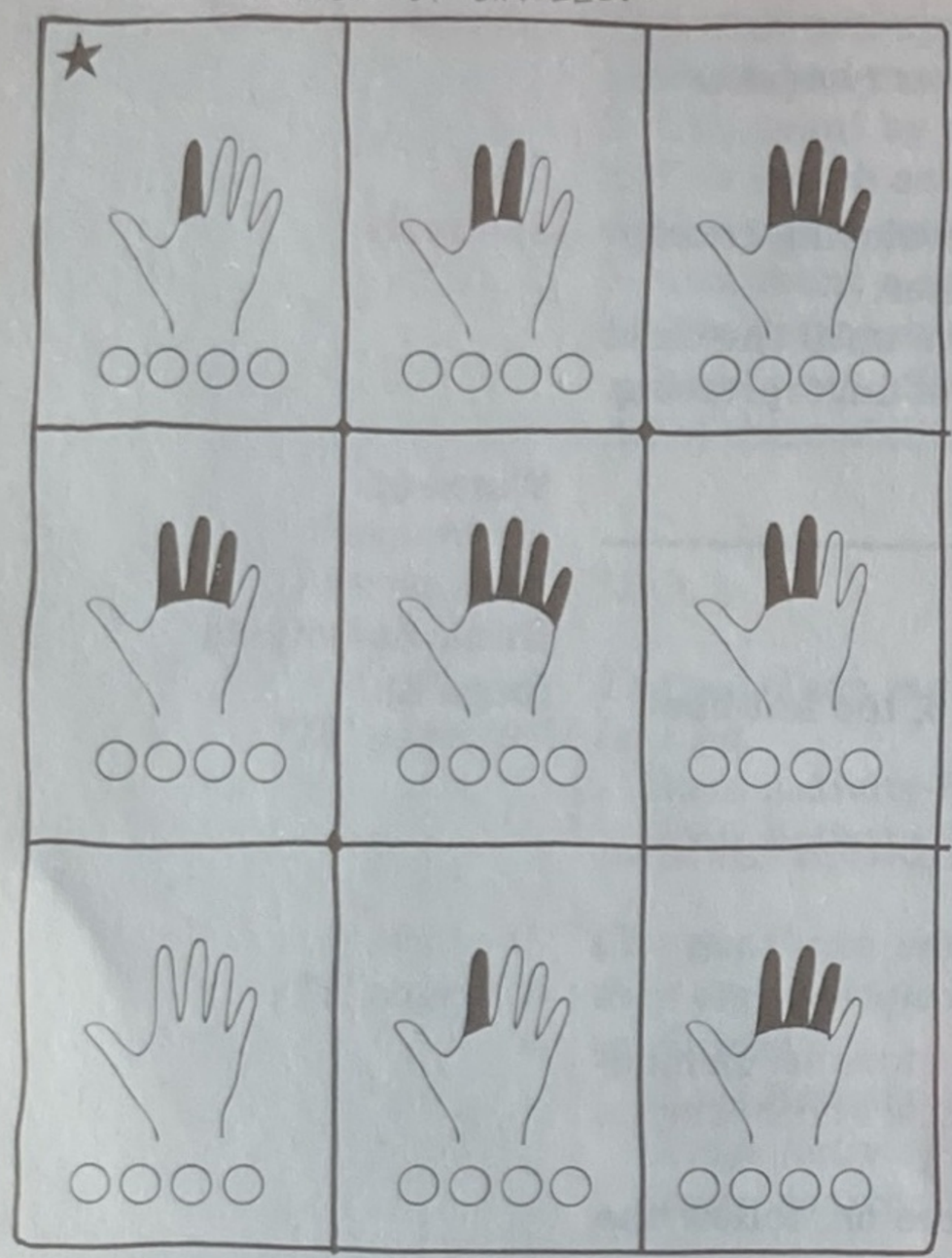
NOW LOOK AT THE NEXT HAND IN THE SAME ROW. From here on, follow the same pattern for the remainder of the page.

Book Activity 8B
(page 7)

NOW TURN TO PAGE 7. LOOK AT THE BOX WITH THE STAR IN THE CORNER. HOW MANY FINGERS ARE PRESSED ON THAT HAND? Two.

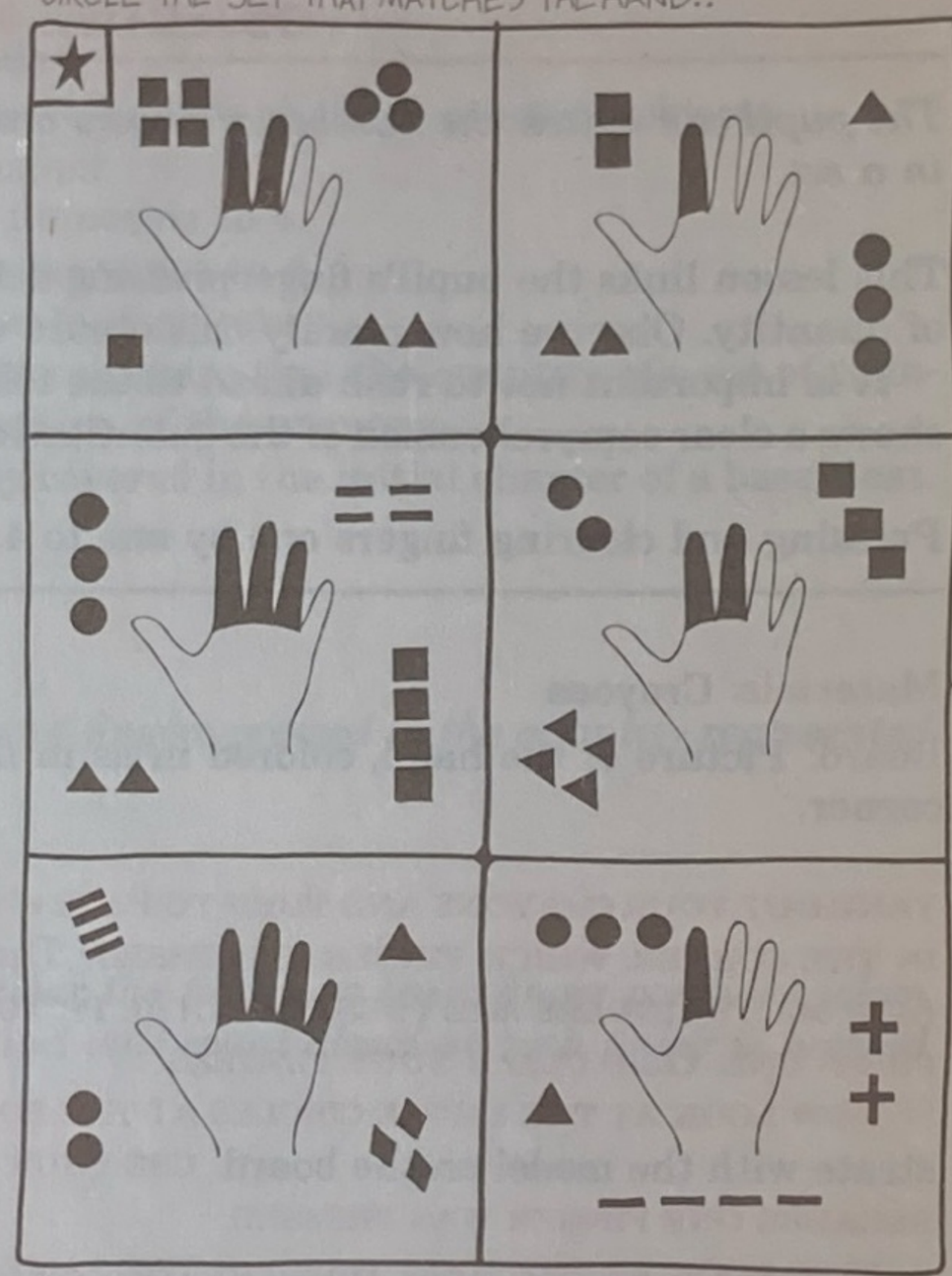
FIND A SET THAT HAS TWO OBJECTS IN IT. DRAW A LINE FROM THE HAND TO THE SET. Follow the same pattern on the rest of the page.

PRESS YOUR FINGERS AS SHOWN. THEN COLOR THE CORRECT NUMBER OF CIRCLES.



6

CIRCLE THE SET THAT MATCHES THE HAND..



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OBJECTIVE 9

The pupil can press, read, and clear the first four basic finger positions when they are identified numerically and will count aloud as each finger is pressed or cleared.

Synopsis

In this objective, we want the child to be able to respond to the directions "Press one," "Press two," "Press three," and "Press four," and to "Clear one," "Clear two," "Clear three," and "Clear four." A second focus of this lesson is to have the pupil call out the numbers. While pressing four, for example, the pupil will count, "One, two, three, four." While clearing four, the same count will be made: "One, two, three, four." These skills will be used constantly in succeeding lessons, and they will be further reinforced in those lessons.

Warm-up

Review Class Activity 5B.

Class Activity 9

SUPPOSE I SAY TO YOU, "PRESS ONE." WHAT DO I WANT YOU TO DO? Press my index finger. FINGERS READY? PRESS ONE.

I WANT YOU TO COUNT ALONG WITH ME AS YOU PRESS YOUR FINGERS. WATCH ME FIRST. WHEN I SAY "PRESS ONE," I WANT YOU TO PRESS ONE FINGER AND AT THE SAME TIME SAY "ONE" IN A NICE, LOUD VOICE, LIKE THIS (demonstrate): "ONE!"

READ YOUR FINGERS. One. CLEAR ONE. One.

READ YOUR FINGERS. Zero. PRESS TWO. One, two. READ YOUR FINGERS. Two. CLEAR TWO. One, two. READ YOUR FINGERS Zero.

PRESS THREE. One, two, three. NOW CLEAR THREE. One, two, three. READ YOUR FINGERS. Zero.

PRESS FOUR. One, two, three, four. READ YOUR FINGERS. Four. CLEAR FOUR. One, two, three, four. READ YOUR FINGERS. Zero.

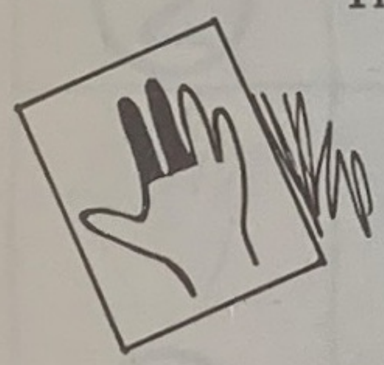
During this exercise, it is important to check that all pupils are pressing and clearing in the correct sequence.

Game Activity 9A

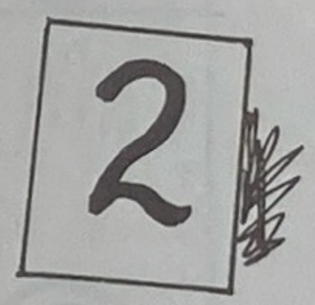
PRESS-CLEAR GAME

Materials:
1. Five 8½ X 11 fingerpress cards (0–4)
2. Five 8½ X 11 numeral cards (0–4)
3. Five 8½ X 11 sets cards (0–4)

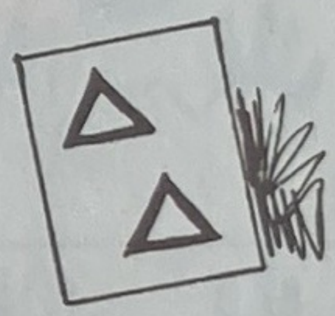
The cards can be made of tagboard.



Fingerpress Card



Numeral Card



Sets Card

Three children stand in front of the class as presenters. Each child holds one of the three shuffled sets. The presenters take turns revealing their cards high overhead. The class presses the number revealed by each presenter while reciting the proper unit-by-unit count. The presenter then says, "Read your fingers." After the class has responded, the presenter says, "Clear your fingers." Each presenter should have at least five cards.

Game Activity 9B Materials: Have every child take out the 0 to 4 numeral cards which are cut from the back of their books.

Pair off the children. The combined set of 10 shuffled numeral cards is given to one child, who acts as presenter. The other child practices pressing and clearing, always accompanied by counting and reading. Then they switch roles.

OBJECTIVE 10

The pupil can press the correct finger combinations for designated numerals and correctly mark the diagrams.

Synopsis

This lesson provides a view of how firmly the child has internalized the relationship of fingerpressing to numerals. In addition, it allows for more extensive practice in fingerpressing.

Warm-up

Press and clear 0 through 4.

Book Activity 10A
(page 8)

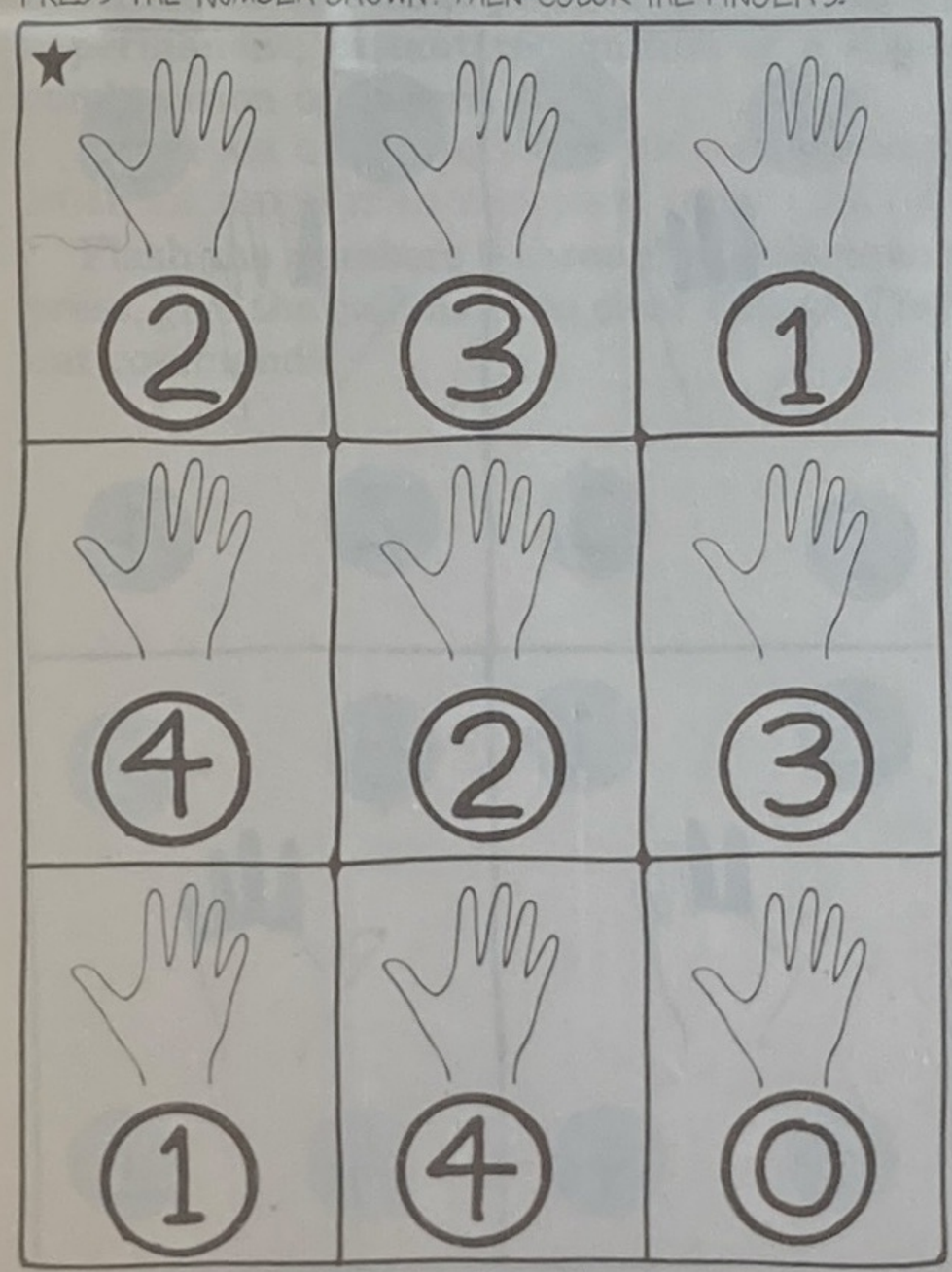
TAKE OUT YOUR FINGERMATH BOOK AND A PENCIL, AND TURN TO PAGE 8. HOLD YOUR FINGERS IN THE READY, CLEARED POSITION. LOOK AT THE BOX WITH THE STAR IN THE CORNER. WHAT IS THE NUMBER UNDER THE HAND? TWO. TWO IS CORRECT.

PRESS TWO. One, two. Be certain that fingers are pressed one by one. LOOK AT YOUR HAND. NOW LOOK AT THE HAND IN THE STARRED BOX. WHICH FINGERS SHOULD BE COLORED IN TO SHOW "PRESS TWO"? The index and the middle fingers. COLOR THOSE FINGERS IN NOW. Work the remainder of the page with the class.

Book Activity 10B
(page 9)

TURN TO PAGE 9. LOOK AT THE BOX WITH THE STAR IN THE CORNER. WHAT IS THE NUMBER IN THE MIDDLE OF THE BOX? TWO. LOOK FOR THE HAND THAT SHOWS TWO BEING PRESSED. WHEN YOU FIND IT, DRAW A LINE FROM THE NUMERAL 2 TO THAT HAND. Work the remainder of the page with the class.

PRESS THE NUMBER SHOWN. THEN COLOR THE FINGERS.



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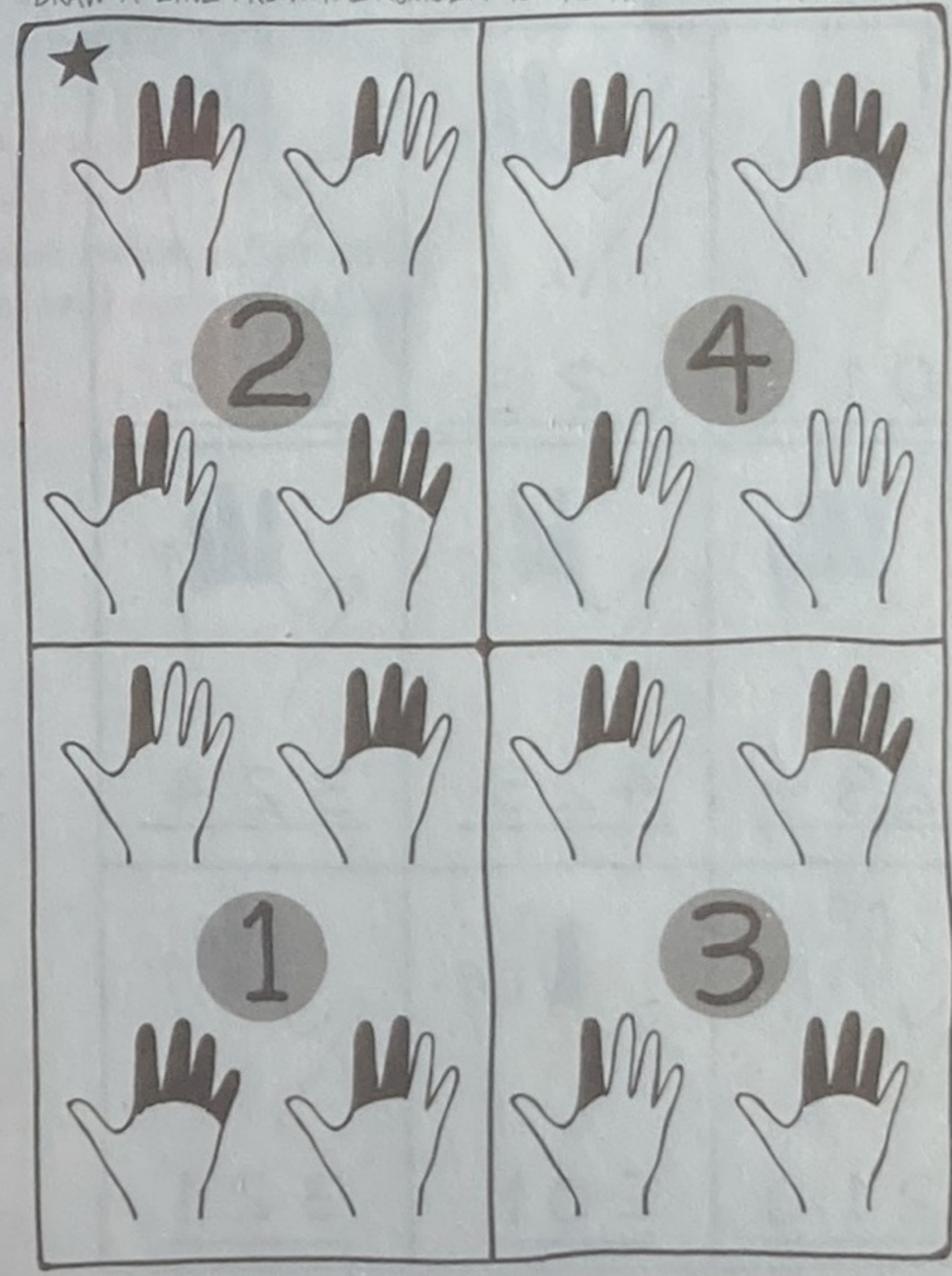
DRAW A LINE FROM THE NUMBER TO THE HAND THAT MATCHES.



9

OBJECTIVE 11

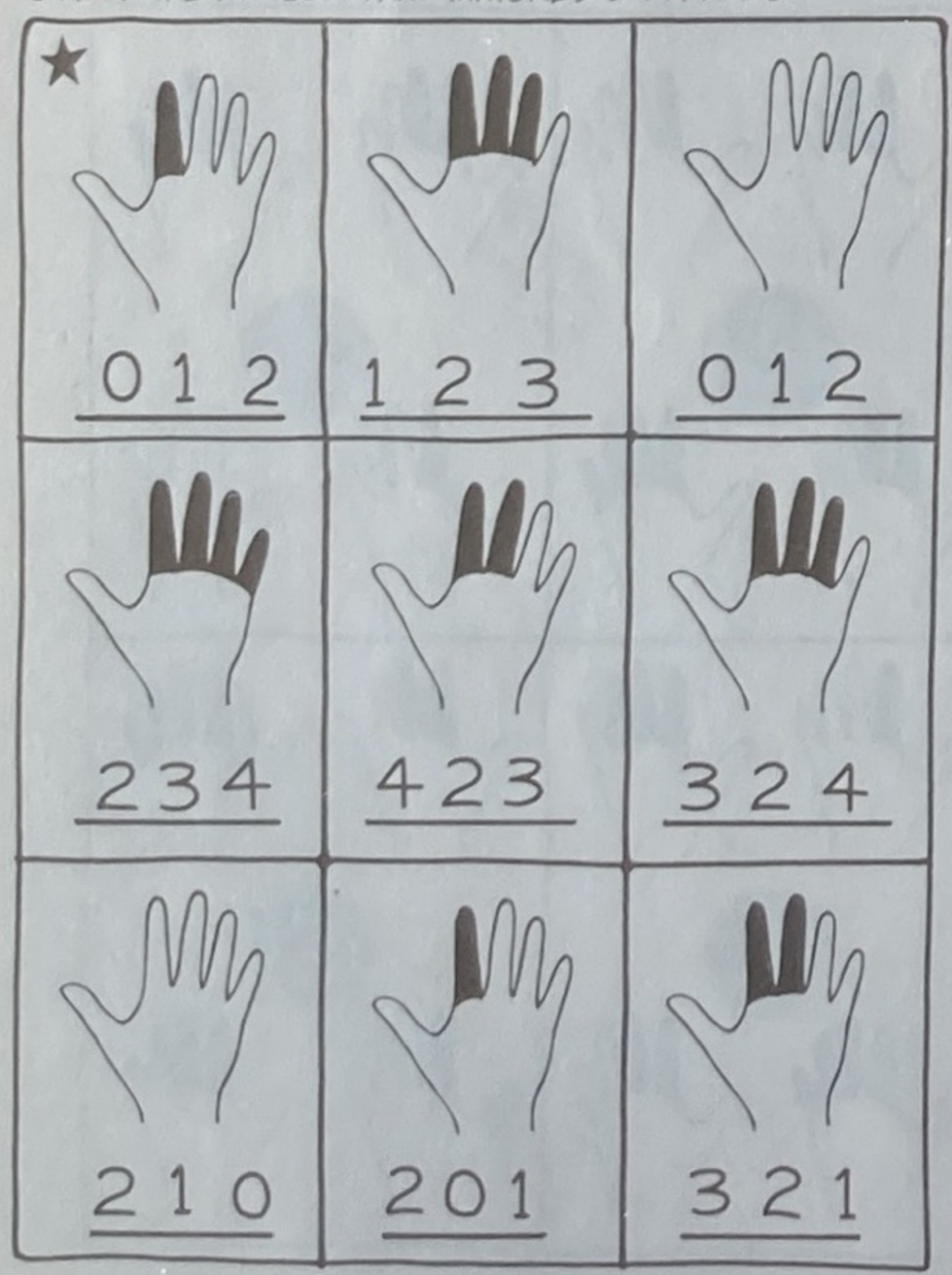
The pupil can identify the numeral represented by the fingerpress shown on an illustrated finger model.

Warm-up Press, clear, read, and write 0 through 4.

Book Activity 11A (page 10) TURN TO PAGE 10. Have the pupils press 1, as indicated in the starred box, and read their fingers. Then have them circle the corresponding numeral in the space below the drawing of the hand. Work the entire exercise with the class.

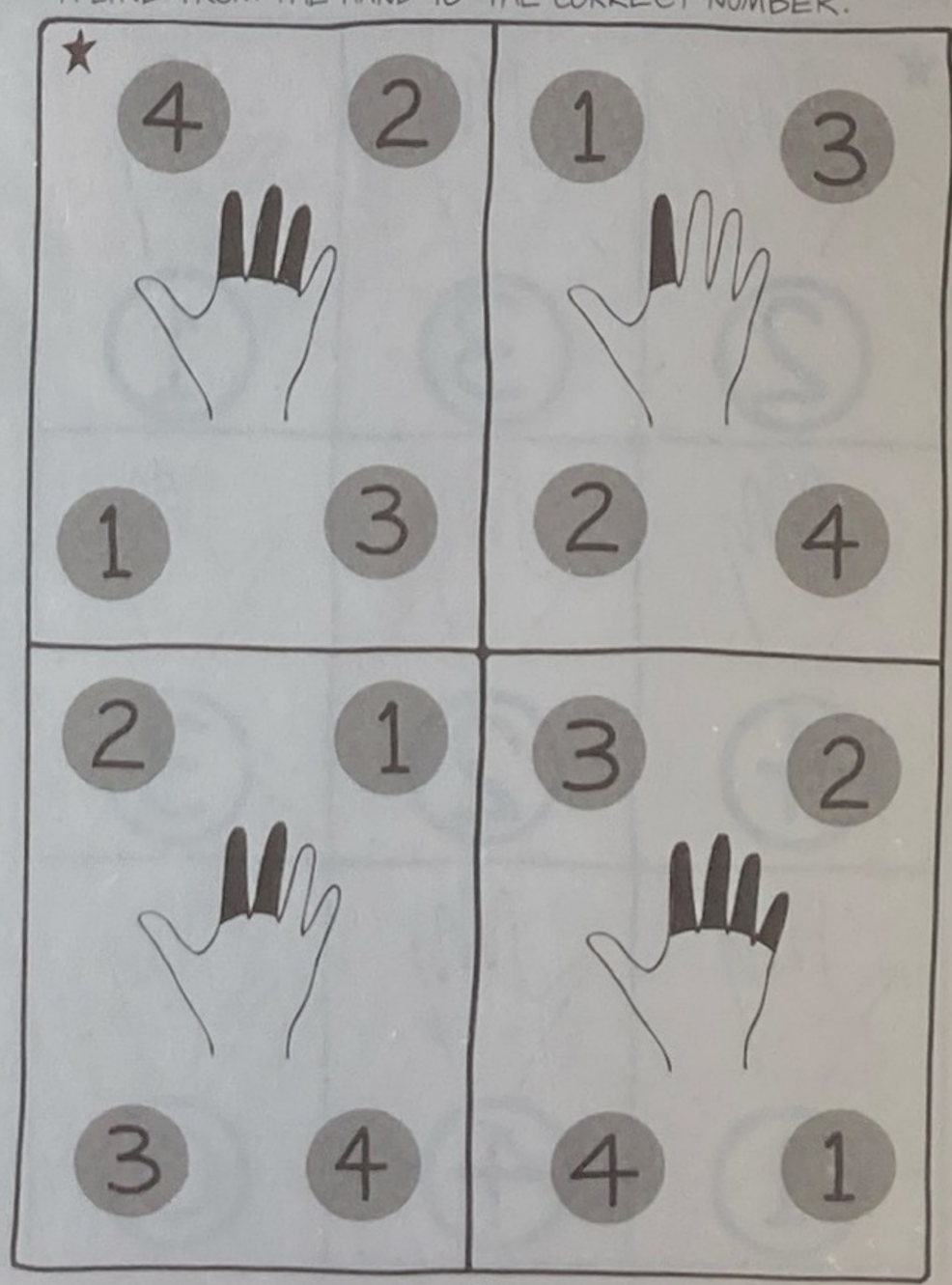
Book Activity 11B (page 11) TURN TO PAGE 11. Have the pupils press 3, as in the starred box, and read their fingers. Then have them draw a line from the hand to the correct numeral. Work the entire exercise with the class.

CIRCLE THE NUMBER THAT MATCHES EACH HAND.



10

PRESS THE AMOUNT SHOWN ON EACH HAND. THEN DRAW A LINE FROM THE HAND TO THE CORRECT NUMBER.



11

OBJECTIVE 12

The pupil can direct press the numbers 0 through 4.

Synopsis

This is the first step in the process of teaching basic facts. The lesson introduces direct pressing, as opposed to the previously learned skill of pressing unit by unit, finger by finger.

Direct pressing of whole numbers must hereafter be included as a part of the daily Fingermath warm-up. (See CBF pages 39 and 40.)

Warm-up

Pressing and clearing 0 through 4, one by one.

Class Activity 12

Materials: Flash cards for the numerals 0 through 4.

YOU ALL KNOW HOW TO PRESS THE NUMBER 2. LET'S DO IT TOGETHER. FIRST, CLEAR YOUR FINGERS. READY? EVERYONE, PRESS 2. One, two.

VERY GOOD. CLEAR YOUR FINGERS.

NOW I'M GOING TO SHOW YOU ANOTHER WAY TO PRESS 2. IT'S MUCH FASTER, TOO. WATCH MY FINGERS. Stand with back to class, at the chalkboard, and demonstrate. PRESS 2. Direct press 2, saying "Two." NOW I'LL CLEAR MY FINGERS AND DO IT AGAIN. WATCH.

PRESS 2. Direct press 2, saying "Two" and then clearing your fingers. I PRESSED MY TWO FINGERS ALL AT ONCE INSTEAD OF ONE AT A TIME AND I SAID "TWO." NOW LET'S ALL DO THAT TOGETHER.

READY? CLEAR YOUR FINGERS. PRESS 2. Two. CLEAR YOUR FINGERS. ONCE MORE, NOW. PRESS 2. Two. CLEAR YOUR FINGERS.

Continue this exercise, first working repeatedly with the same number (2, 3, or 4), and then interchanging the commands. Be certain that the children are direct pressing the right fingers energetically, and calling out the numbers simultaneously. Ultimately they must be capable of responding to a command by immediately direct pressing and calling that number, so that there ensues a permanent, instant recognition of a whole number embodied in a single combination of fingers.

NOW I AM GOING TO HOLD UP SOME NUMBER CARDS. AS SOON AS YOU SEE A NUMBER, PRESS IT IN THIS NEW, DIRECT WAY AND CALL IT OUT.

Flash the numbers 0 through 4, interchangeably, at least twice. After each press, give the command to clear fingers. Then do another oral review, calling out commands.

unit

3

Adding to 4

Basal Reference Preaddition work with numbers through 4.
An introduction to sums in vertical and horizontal forms would be helpful.

Fingermath Prerequisite Unit 2

*Objective 13 (TE page 29)** *The pupil connects the plus sign (+) with sequential pressing.*
Class Activity 13
Book Activity 13 (page 12)**

Objective 14 (TE page 31) *The pupil can press two consecutive numbers, including zero, not beyond sums of 4.*
Game Activity 14
Book Activity 14 (page 13)

Objective 15 (TE page 33) *The pupil can add two numbers by Fingermath and arrive at a sum in response to seeing an equals sign.*
Book Activity 15 (page 14)

Objective 16 (TE page 35) *The pupil can add sums to 4 vertically.*
Book Activity 16 (page 15)

Objective 17 (TE page 36) *The pupil will memorize basic addition facts up to 4.*
Game Activity 17
Book Activity 17A (page 16)
Book Activity 17B (page 17)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 13

The pupil connects the plus sign (+) with sequential pressing.

Synopsis

This lesson
1. Links the plus sign (+) to finger activity.
2. Teaches the class to count off the second addend separately from the first addend, as, for example: PRESS ONE. One. ADD THREE. One, two, three.

It is very important that you do not let the response to "Add three" be a continuation of the previous "One" and be called out as "Two, three, four." The count for each new addend always begins with "One."

It should be noted that this lesson does not seek to have pupils focus on the answer. That is the function of a succeeding lesson.

Vocabulary

Add one; add two; add three; add four

Warm-up

Direct press 1 through 4 (Objective 12).
Board:

3 + 1

Class Activity 13

PRESS THREE. Three. NOW WHEN I TELL YOU TO, ADD ONE MORE, BUT I WANT YOU TO SAY "ONE" AS YOU PRESS ONE MORE. READY? PRESS ONE MORE. One. Don't allow the children to say "four," even though they have already pressed three; the new addend is to be counted aloud as "one," thus stressing the *one more* feature. CLEAR YOUR FINGERS. Write on the board as you explain.

LET'S REVIEW WHAT WE HAVE DONE. WE STARTED BY PRESSING THREE. Point to *3* on the board. AND THEN WE ADD ONE MORE. Point to *+1* on the board.

Write *2 + 2* on the board.

PRESS TWO. Point to the *2*. Two.

NOW ADD TWO MORE.

Point to the *+2*. One, two. CLEAR YOUR FINGERS. (We are purposely not paying any attention to the answer in this activity. That is why we do not have the class read fingers.) Repeat the exercise, using different addends, such as 1 + 2; 3 + 0; 1 + 3; 2 + 1; 3 + 1; 2 + 2. Let each pupil in turn verbalize and press. Repeat the addends for more practice. Note that the first addend is direct pressed while the next is pressed one by one.

Book Activity 13
(page 12)

Have the class open their books to page 12. Do the exercises orally with students.

If possible, allow them to work by themselves.

PRESS EACH PAIR OF NUMBERS

1+1	1+2	1+3
2+1	2+2	3+1
2+2	1+1	2+1
1+2	1+3	3+1

12

OBJECTIVE 14

The pupil can press two consecutive numbers, including zero not beyond sums of 4.

Synopsis

This objective shows pupils the procedure for adding zero in either position of a sum. Unlike pressing 1, 2, 3, or 4, pressing 0 means don't do anything. Don't press and don't call out "zero." A discussion of how many things I have when I have zero things may be useful. Pressing zero can then be easily translated into *not pressing.* Totals are not called for in this objective.

Warm-up

Practice pressing consecutive addends.

Game Activity 14

ZERO GAME

The rules of the zero game are as follows: When a number from 1 through 4 is called, the class fingerpresses and verbalizes that number. However, when 0 is called, pupils neither press nor verbalize. Only when zero is the first addend, may the second addend be directly pressed. The game can be lengthened by adding the "Simon says" format into the activity. Each number should be called two or three times.

Remind the class of the procedure for pressing or adding 0. Pressing and adding are the same things, just as clearing and subtracting are the same.

Book Activity 14
(page 13)

TURN TO PAGE 13.

LOOK AT THE BOX WITH THE STAR. WHAT SHOULD WE DO FIRST? Press one. PRESS ONE. One. NOW WHAT SHOULD WE DO? Press three. PRESS THREE. One, Two, Three. CLEAR YOUR FINGERS.

Work the remaining examples with the class.

PRESS EACH PAIR OF NUMBERS. ONLY THE FIRST NUMBER IS DIRECT PRESSED.

★ 1+3	0+1	2+2
0+3	3+1	0+2
1+2	3+0	1+1
0+4	2+1	1+0

13

OBJECTIVE 15

The pupil can add two numbers by Fingermath and arrive at a sum in response to seeing an equals sign.

Synopsis

This lesson introduces the equals sign to Fingermath and links it to the phrase "Read your fingers."

At this point we will begin to use the commands *press* and *add* interchangeably.

Warm-up

Pressing sequential addends. (Objective 13).

Vocabulary

Equals

Board:

2 + 1 2 + 1 =

Book Activity 15 (page 14)

Ask someone in class to demonstrate how to do the first sum on the board.

NOW THAT WE KNOW WHAT TO DO WHEN WE SEE SOMETHING LIKE THIS point to *2 + 1* on the board. LET'S LOOK TO SEE WHAT THIS MEANS, point to the equals sign in the equation on the board PRESS TWO. Two. ADD ONE. One. NOW READ YOUR FINGERS. Point to the equals sign. Three. Write *3* after the equals sign. THE EQUALS SIGN TELLS YOU TO READ YOUR FINGERS.

WHEN YOU SEE AN EQUALS SIGN IN AN EXAMPLE LIKE THIS ONE, WHAT DO YOU DO? Read your fingers. Write *3 + 1* = on the board. TRY THIS ONE . . . LET'S DO IT TOGETHER. PRESS 3.

ADD ONE.

. . . EQUALS, OR READ YOUR FINGERS. Four.

WRITE THE 4 NEXT TO THE EQUALS SIGN.

Have the children turn to page 14.

Since many children will know how to do this work mentally, it is necessary to be certain that the class does this work using Fingermath.

Do the page with the class, stressing that "Read your fingers" corresponds to the equals sign.

DIRECT PRESS THE FIRST NUMBER. ADD THE SECOND NUMBER. WRITE THE ANSWER.

1+3=	2+1=	1+1=
0+1=	2+2=	0+2=
3+0=	3+1=	0+0=
1+2=	4+0=	2+0=
0+3=	1+0=	0+4=

14

OBJECTIVE 16

The pupil can add sums to 4 vertically.

Direct pressing 0 through 4.

Most basal texts cover addition horizontally and vertically. The child should feel at home with addition in either form.

Warm-up

Board:

Book Activity 16 (page 15)

2 + 2 =	2 + 1 =	3 + 0 =
1 + 3 =	3 + 1 =	0 + 3 =

Begin by demonstrating that the two forms have the same meaning by transposing the first board example from a horizontal to a vertical form.

$$2 + 2 = \quad \begin{array}{r} 2 \\ \underline{+\,2} \end{array}$$

Have volunteers come to the board and transpose each sum from a horizontal to a vertical form and then fingerpress the sum, writing the answer under the line. Leave plenty of board room for pupils' work. After all the board examples have been done, have class turn to page 15.

Have the class transpose each example, fingerpress the vertical form, and write the answer under the line.

Note that in the top row, each vertical rewrite is provided.

WRITE EACH EXAMPLE VERTICALLY. THEN ADD THE NUMBERS AND WRITE THE ANSWER.

2+1 $\begin{array}{r} 2 \\ \underline{+1} \end{array}$	3+1 $\begin{array}{r} 3 \\ \underline{+1} \end{array}$	1+1 $\begin{array}{r} 1 \\ \underline{+1} \end{array}$
1+2	1+3	1+6
2+2	0+1	1+2
3+0	4+0	2+2
1+3	2+1	3+1

15

OBJECTIVE 17

The pupil will memorize basic addition facts up to 4.

Synopsis The Fingermath program is not designed or intended to be a substitute for mental activity. Indeed, helping children to commit numerical facts to memory is but one more transition from fundamental, concrete levels of number awareness to more abstract levels.

Vocabulary Direct press

Warm-up Sums to 4; direct pressing 1 to 4.

Game Activity 17 DIRECT PRESS GAME

Materials: A set of flash cards for the following addition facts and numbers:
0, 1, 2, 3, 4, 0 + 4, 1 + 2, 1 + 1, 1 + 0
2 + 2, 2 + 1, 2 + 0, 2 + 1, 4 + 0, 3 + 0

Begin by demonstrating the two previously learned ways to press the sum 2 + 2.

1. Pressing 2 + 2 by ones (one, two; one, two).
2. Pressing 2 direct +2 (two; one, two). Note that only the first addend is direct pressed.

I AM GOING TO HOLD UP NUMBER CARDS. AS SOON AS YOU SEE THE CARD, PRESS THE NUMBER OR THE SUMS ON YOUR FINGERS.

In each case ask different pupils to show the class which way they pressed.

Book Activity 17 (page 16 and 17)

Have the class turn to page 16 and 17 and complete the exercises.

Direct pressing beyond the first addend is a more advanced skill which is not addressed at this point. However, if a child demonstrates an awareness and comprehension of this manipulation it need not be discouraged. Care should be taken to have all pupils continue practicing the technique of unit-by-unit pressing, even when direct pressing is learned.

If several children are observed to be direct pressing the second addend, take additional time to present this as a third, direct way to press the sum 2 + 2:

1. Pressing 2 + 2 by ones (one, two; one, two).
2. Pressing 2 direct + 2 (two; one two).
3. Pressing 2 + 2 direct (two; two).

Then practice these interchangeably.

The same procedure can be used to present 3 as a second addend when combined as 1 + 3.

ADD THE NUMBERS. DIRECT PRESS THE FIRST NUMBER.

2+2=__	2+0=__	0+2=__	1+3=__
3+1=__	0+3=__	2+1=__	4+0=__
1+2=__	3+0=__	1+0=__	0+4=__
1+1=__	2+1=__	0+1=__	3+1=__

16

ADD THE NUMBERS. DIRECT PRESS THE FIRST NUMBER

0 +3	2 +1	4 +0	2 +2
2 +0	0 +2	1 +3	0 +4
3 +1	1 +0	3 +0	1 +2
1 +1	2 +1	0 +1	3 +1

17

unit

4

The 4 to 5 Exchange and Numeration to 5

(See CBF page 28).
In this unit, the student learns the first of a series of exchanges that characterize Fingermath in the same way that place value characterizes our decimal number system. The exchange in Fingermath achieves the same salutary effect for its practitioners that regrouping has achieved in our number system: both systems are made more compact, comprehensible, efficient, easy to manipulate, and faster.

The exchange is at the heart of the effectiveness of the Fingermath program because it performs the place value function as a manual operation. It makes it concrete. At first, these exchanges take simple forms, such as the 4 to 5 exchange to be learned in this unit. We are teaching pupils to think in terms of groupings. In this unit, we are concerned with grouping by fives.

Basal Reference

The pupil should have had extensive experience oral counting to 5 and selecting sets of five objects. For that reason the first two objectives review these activities.

Fingermath Prerequisite

Unit 3

*Objective 18 (TE page 41)**

The pupil can identify and count sets of five.
Book Activity 18 (page 18)**

Objective 19 (TE page 42)

The pupil can count five objects and associate the press of the right-hand thumb with a set of five objects.
Book Activity 19 (page 19)
Class Activity 19

Objective 20 (TE page 45)

The pupil can count to 5, making a 4-to-5 exchange called the Little Flipper.
Class Activity 20
Book Activity 20 (page 20)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 18

The pupil can identify and count sets of five.

Synopsis

This is a readiness activity. If a pupil has difficulty with this activity it is a clear sign that the child is not ready to work more abstractly with number concepts and further work should therefore be postponed. The activity also gives the pupil an opportunity to do more concrete counting.

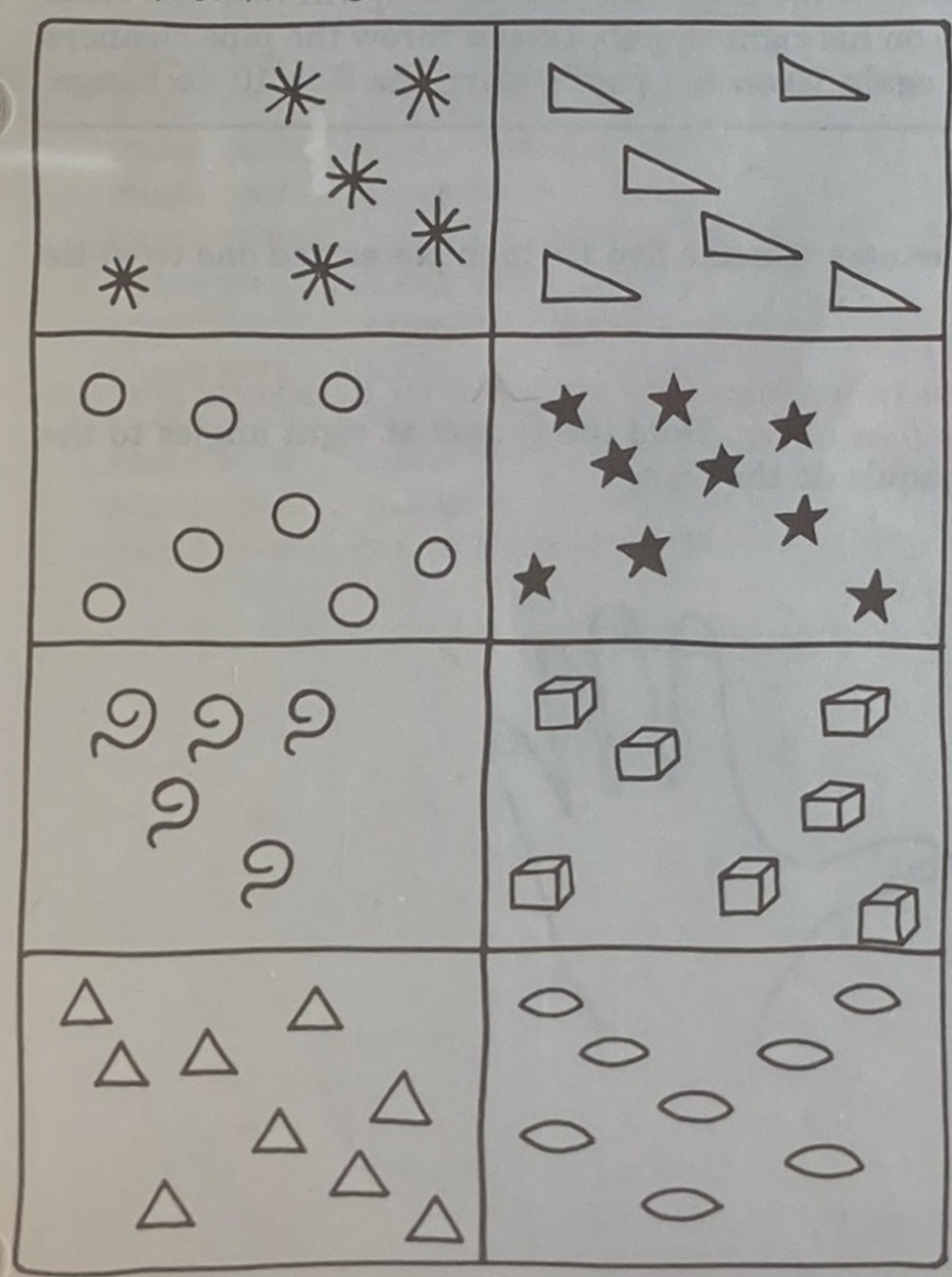
Warm-up

Direct press 0 to 4; sums to 4.

Book Activity 18 (page 18)

Begin by asking a volunteer to count five classmates, who are asked to stand up. Ask children to find sets of five things in the room. Ask seven or eight pupils to stand in front of the room and ask a youngster to separate five from the group. Next, have them open their books to page 18. Each pupil is to count out five stars and circle them. Continue in the same way with all the sets of objects on the page. Do *not* ask the students to name the total number of objects at this stage, even though some may do so spontaneously.

CIRCLE SETS OF 5.



18

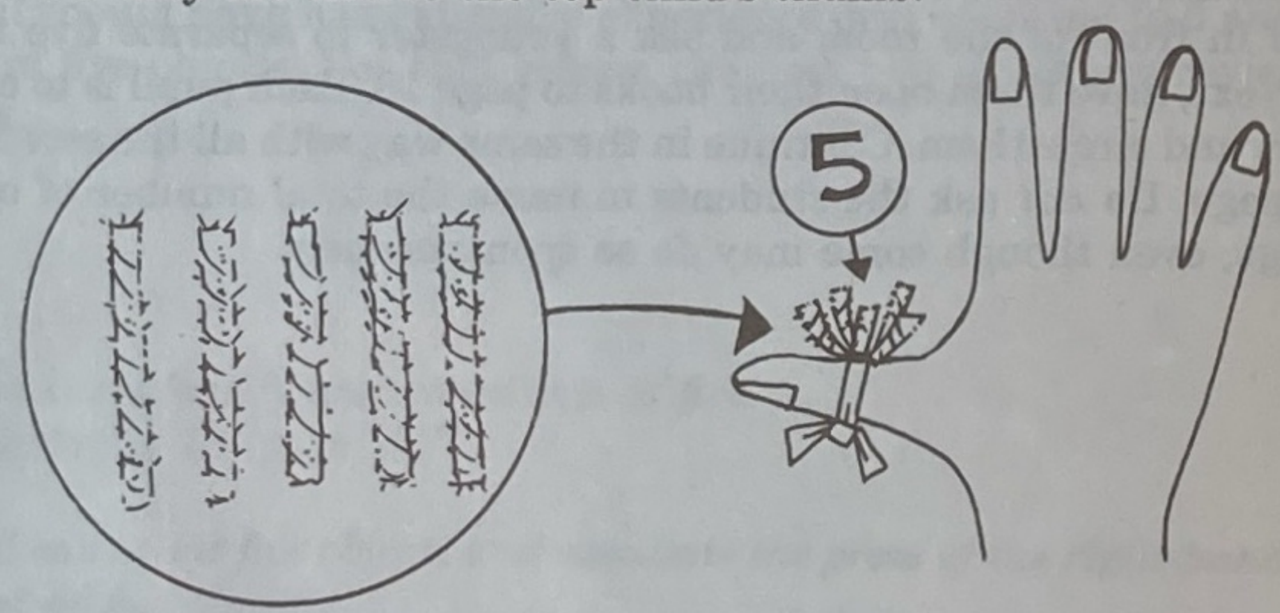
OBJECTIVE 19

The pupil can count five objects and associate the press of the right-hand thumb with a set of five objects.

Synopsis Because the thumb is being used as a 5s counter, it is useful to develop the specialness of the thumb. Stress its difference from the other fingers and the fact that it is set apart from them.

Having counted five objects and grouped them in a set, we now make an association between the pupil's right thumb, and the grouping of five objects. One way to accomplish this is to cut pipe cleaners into short (about 1½ inch) pieces and allow each pupil to tie five to the thumb with a plastic-bag tie.

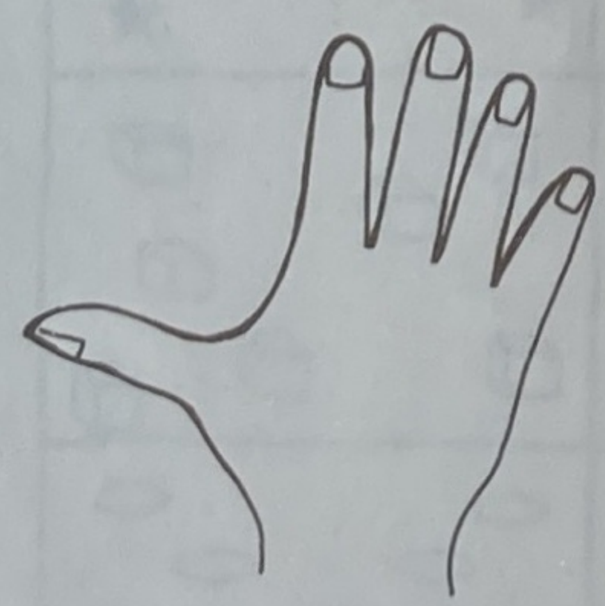
The pipe cleaners should be twist-tied together, as in the pictures in the figure, before they are tied to the top child's thumb.



That, or similar reminders of the fiveness of the thumb, will help the child to focus the concept of five on his right thumb. Do not throw the pipe cleaners away. You will use them again when the pupils learn the 9 to 10 exchange.

Warm-up Oral count to 5.
Materials: Enough pipe cleaners to make five 1½-inch pieces and one twist-tie for each student.

Book Activity 19 (page 19) TODAY WE ARE GOING TO USE OUR THUMBS FOR FINGERMATH. EVERYONE HOLD UP YOUR RIGHT HAND JUST AS I AM DOING. Hold the thumb at right angles to the fingers and see that the pupils do the same.



THE THUMB IS REALLY VERY SPECIAL. IT LOOKS DIFFERENT FROM THE OTHER FINGERS, AND IT IS USED DIFFERENTLY. YOU CAN TURN YOUR THUMB SO THAT IT PRESSES AGAINST THE INSIDE OF ANY OF THE OTHER FINGERS, SO THAT IT IS EASY TO PICK THINGS UP AND HANDLE THEM AND HOLD THEM.

CAN YOU IMAGINE HOW DIFFICULT IT WOULD BE TO DO A LOT OF THINGS IF THE THUMB FACED STRAIGHT UP LIKE THESE FOUR? Point to the four fingers. IT CAN MOVE SIDEWAYS TOO. YES, THE THUMB IS REALLY VERY SPECIAL. AND BECAUSE IT IS SPECIAL, WE HAVE GIVEN IT A SPECIAL JOB TO DO. WHILE EACH OF OUR OTHER FINGERS COUNTS ONLY ONE, THE THUMB, *ALL BY ITSELF,* COUNTS FIVE. IF I PRESS MY INDEX FINGER, OR MY MIDDLE FINGER, OR MY RING FINGER, OR MY PINKY, I AM ONLY ADDING ONE EACH TIME, BUT IF I PRESS MY THUMB, I AM ADDING *FIVE.*

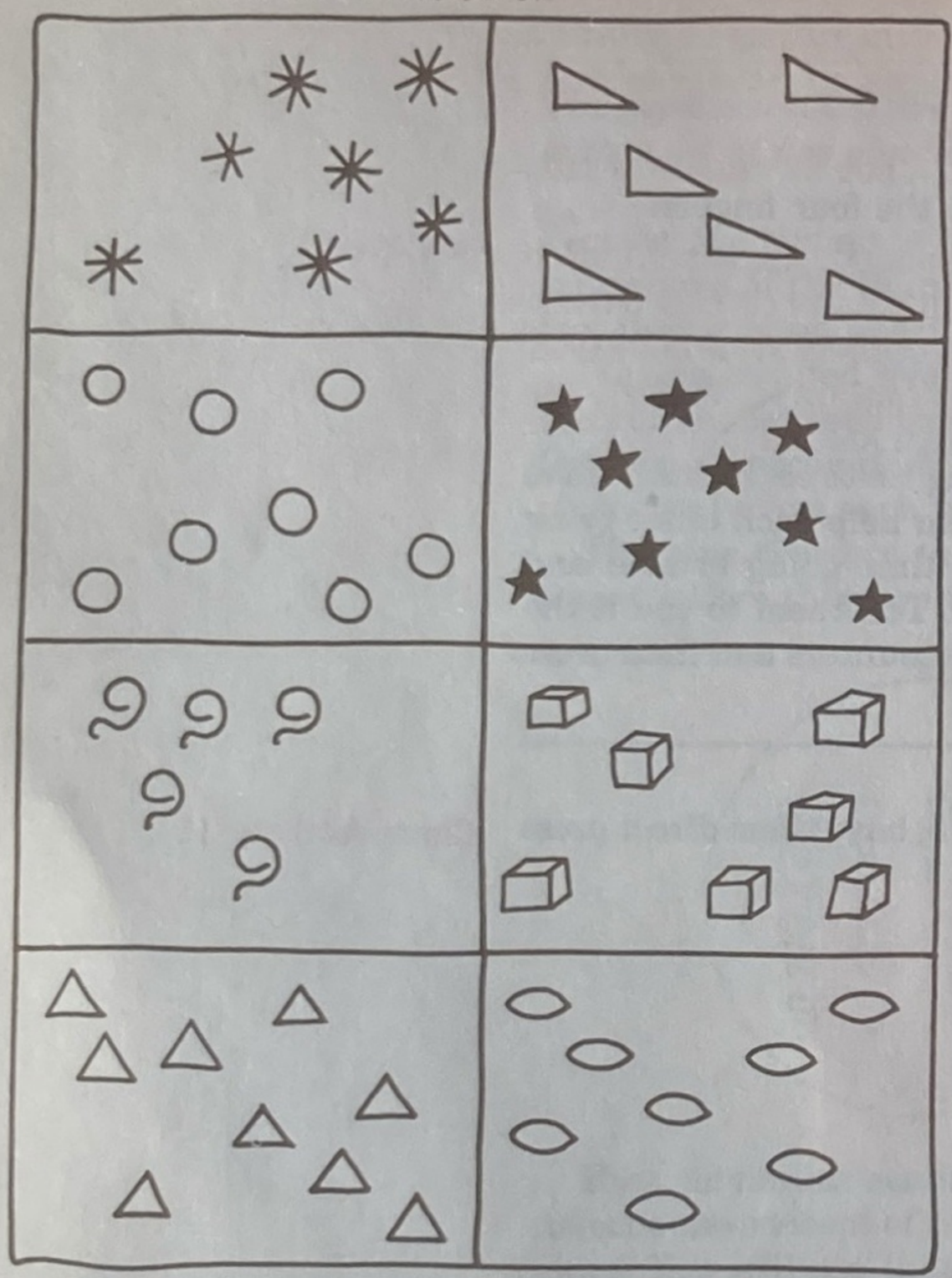
Hand out from six to nine pipe cleaners and one bag tie to each child. Have each child count out five pipe cleaners, and have them help each other tying the five pipe cleaners to their right thumbs. Spend time going around and helping. Have the class open their books to page 19. Tell them to count the number of counters in each box. Have them circle five counters and then press their thumbs and say "five."

Class Activity 19

Having taught the class that the thumb direct presses 5, have them direct press the numbers 1 through 5 repeatedly as follows:

PRESS TWO . . . CLEAR YOUR FINGERS
PRESS FOUR . . . CLEAR YOUR FINGERS
PRESS FIVE . . . CLEAR YOUR FINGERS
PRESS ONE . . . CLEAR YOUR FINGERS
PRESS THREE . . . CLEAR YOUR FINGERS
PRESS FOUR . . . CLEAR YOUR FINGERS
PRESS FIVE . . . CLEAR YOUR FINGERS
PRESS ONE . . . CLEAR YOUR FINGERS
PRESS FIVE . . . CLEAR YOUR FINGERS
PRESS FOUR . . . CLEAR YOUR FINGERS
PRESS ONE . . . CLEAR YOUR FINGERS
PRESS THREE . . . CLEAR YOUR FINGERS
PRESS TWO . . . CLEAR YOUR FINGERS
PRESS FOUR . . . CLEAR YOUR FINGERS
PRESS FIVE . . . CLEAR YOUR FINGERS
PRESS FOUR . . . CLEAR YOUR FINGERS
PRESS FIVE . . . CLEAR YOUR FINGERS
PRESS FOUR . . . CLEAR YOUR FINGERS
PRESS FIVE . . . CLEAR YOUR FINGERS

CIRCLE 5 COUNTERS. PRESS 5.



19

OBJECTIVE 20

The pupil can count to 5, making a 4 to 5 exchange called the little flipper.

Synopsis

Little flipper is the name of the hand operation that adds one to four pressed fingers. At this stage, it is important that the student learns to make a crisp flip to effect the 4 to 5 exchange, and to associate the flip with adding one to the count.

Class Activity 20

TODAY WE ARE GOING TO LEARN HOW TO COUNT TO FIVE ON OUR FINGERS. WE WILL MEET A NEW FRIEND WHO IS CALLED THE LITTLE FLIPPER. THE LITTLE FLIPPER IS THE ONE WHO SHOWS US HOW TO GET FROM 4 TO 5 ON OUR FINGERS. IN A FEW MINUTES, I AM GOING TO TELL YOU THE STORY OF THE LITTLE FLIPPER, BUT BEFORE I DO, I WANT TO SHOW YOU WHAT THE LITTLE FLIPPER DOES, SO THAT WHEN I TELL YOU HER STORY, YOU CAN PRESS YOUR FINGERS ALONG WITH ME.

PRESS FOUR BY ONES. One, two, three, four. NOW IF I WANT TO GET FROM FOUR TO FIVE, I WILL USE THE LITTLE FLIPPER. SHE GETS US FROM FOUR TO FIVE LIKE THIS ... WATCH. Demonstrate facing the board so that the class is facing the same way as you. When you make the flip, insist that everyone make a large and distinct flip. Have the class practice the flip repeatedly while you go from child to child observing their technique. Be sure the students make a distinct flip that raises the four fingers high.

Tell the class that each time a new friend comes to help the flipper, in the story, they will participate by pressing another finger until they get to the flip.

The Little Flipper

LITTLE FLIPPER IS THE YOUNGEST CHILD IN THE DOLPHIN FAMILY. BESIDES FLIPPER, THERE ARE BUMPER, HOPPER, AND THE TWINS, WIGGLE AND WOGGLE. THEY ALL LIVE IN THE OCEAN OFF THE COAST OF CALIFORNIA. FLIPPER'S PARENTS HAVE ALWAYS WARNED HER NEVER TO GO NEAR CAVE MOUNTAIN, WHICH IS JUST A LITTLE WAY FROM THEIR HOUSE, BECAUSE DANGEROUS ROCKS AND BOULDERS COME ROLLING DOWN THE MOUNTAIN WITHOUT WARNING.

ONE DAY, WHEN HER MOTHER AND FATHER ARE AWAY, LITTLE FLIPPER GOES TO CAVE MOUNTAIN AGAINST HER PARENTS' WISHES, JUST FOR A LOOK. WHEN SHE GETS THERE, SHE SAYS TO HERSELF:

"I CAN'T SEE ANYTHING TO BE AFRAID OF. THOSE CAVES DON'T LOOK DANGEROUS."

AND BEFORE YOU KNOW IT, LITTLE FLIPPER IS PLAYING FIRST IN ONE CAVE AND THEN ANOTHER. SHE DOESN'T EVEN HEAR THE ROCK COME ROLLING DOWN THE MOUNTAIN UNTIL IT CRASHES INTO THE CAVE ENTRANCE AND SEALS THE CAVE SHUT ... WITH HER INSIDE.

WELL, FLIPPER PUSHES AND PUSHES AT THE ROCK, BUT SHE IS JUST ONE SMALL DOLPHIN PUSHING, AND EVEN THOUGH SHE PUSHES AS HARD AS SHE KNOWS HOW, SHE CAN'T MOVE THE ROCK.

LUCKILY, HOPPER, WHO IS THE OLDEST DAUGHTER IN THE FAMILY, HAS ALREADY MISSED LITTLE FLIPPER. AFTER SEARCHING THE NEIGHBORHOOD, SHE FINALLY REMEMBERS CAVE MOUNTAIN AND DECIDES TO SEE IF LITTLE FLIPPER HAS DISOBEYED HER PARENTS' WARNING AND GONE THERE.

WHEN SHE HEARS FLIPPER CRYING FOR HELP, SHE SWIMS OVER AS QUICKLY AS POSSIBLE TO HELP. BUT EVEN WITH TWO OF THEM PUSHING WITH ALL THEIR MIGHT, THEY CANNOT MOVE THE ROCK.

SO HOPPER SWIMS BACK TO THE VILLAGE TO GET BUMPER, WHO IS BIG AND STRONG. BUT EVEN WITH THREE OF THEM PUSHING, THE ROCK WON'T MOVE. BUMPER KNOWS WHERE WIGGLE IS, AND BRINGS HIM BACK TO HELP. NOW THERE ARE FLIPPER, HOPPER, BUMPER, AND WIGGLE, ALL PUSHING THE ROCK. THEY CAN

FEEL IT MOVING, BUT TRY AS THEY MIGHT, THE FOUR OF THEM STILL CAN'T FLIP IT OVER.

"WE NEED ONE MORE TO FLIP THIS ROCK," HOPPER SAYS. "I'LL FETCH WOGGLE."

WHEN HOPPER RETURNS WITH WOGGLE, THE FIVE OF THEM EASILY FLIP THE ROCK OVER AND FREE LITTLE FLIPPER.

LITTLE FLIPPER FEELS VERY SORRY FOR NOT HAVING LISTENED TO HER PARENTS' WARNING, AND THANKS HER BROTHERS AND SISTERS GRATEFULLY.

WHEN THEY ALL ARRIVE HOME, LITTLE FLIPPER GOES TO HER PARENTS AND TELLS THEM THE WHOLE STORY. SHE TELLS THEM HOW SHE HAS DISREGARDED THEIR WARNING ABOUT CAVE MOUNTAIN AND THE LESSON IT HAS TAUGHT HER. AND THEN SHE TELLS THE STORY OF HER RESCUE.

This next part is to be narrated while the teacher and the class press first one finger, then two, then three, and then four, at the points in the story marked by asterisks. The flip to the thumb should be made when the rock is flipped clear of the cave entrance, *not* when the fifth dolphin comes to help.

"FIRST," LITTLE FLIPPER SAID, "I PUSHED, AND PUSHED AND PUSHED * BUT I COULDN'T MOVE THE ROCK. THEN HOPPER CAME ALONG, AND THE TWO OF US ** PUSHED AND PUSHED, BUT THE ROCK WOULD NOT MOVE, SO HOPPER GOT BUMPER TO HELP AND THEN THERE WERE THREE OF US *** WHO PUSHED AND PUSHED AND PUSHED. BUT THE ROCK WAS VERY HEAVY AND WE COULDN'T MOVE IT, SO THEY SWAM BACK TO THE VILLAGE AND GOT WIGGLE TO HELP. NOW FOUR OF US **** PUSHED AND PUSHED AND PUSHED AND PUSHED. WE COULD FEEL THE ROCK MOVING BUT IT WAS STILL TOO HEAVY FOR US TO HANDLE. SO WE GOT *ONE MORE* DOLPHIN TO HELP US, AND WITH ALL FIVE OF US PUSHING, WE *FLIPPED* ***** THE ROCK OVER AND I WAS FREE.

This last part of the story can be repeated one more time with full participation. After this activity, go around to individual students to check how they make their flip. Insist on a large and deliberate motion ending with the fingers being fully cleared and thumb being firmly pressed.

Book Activity 20
(page 20)

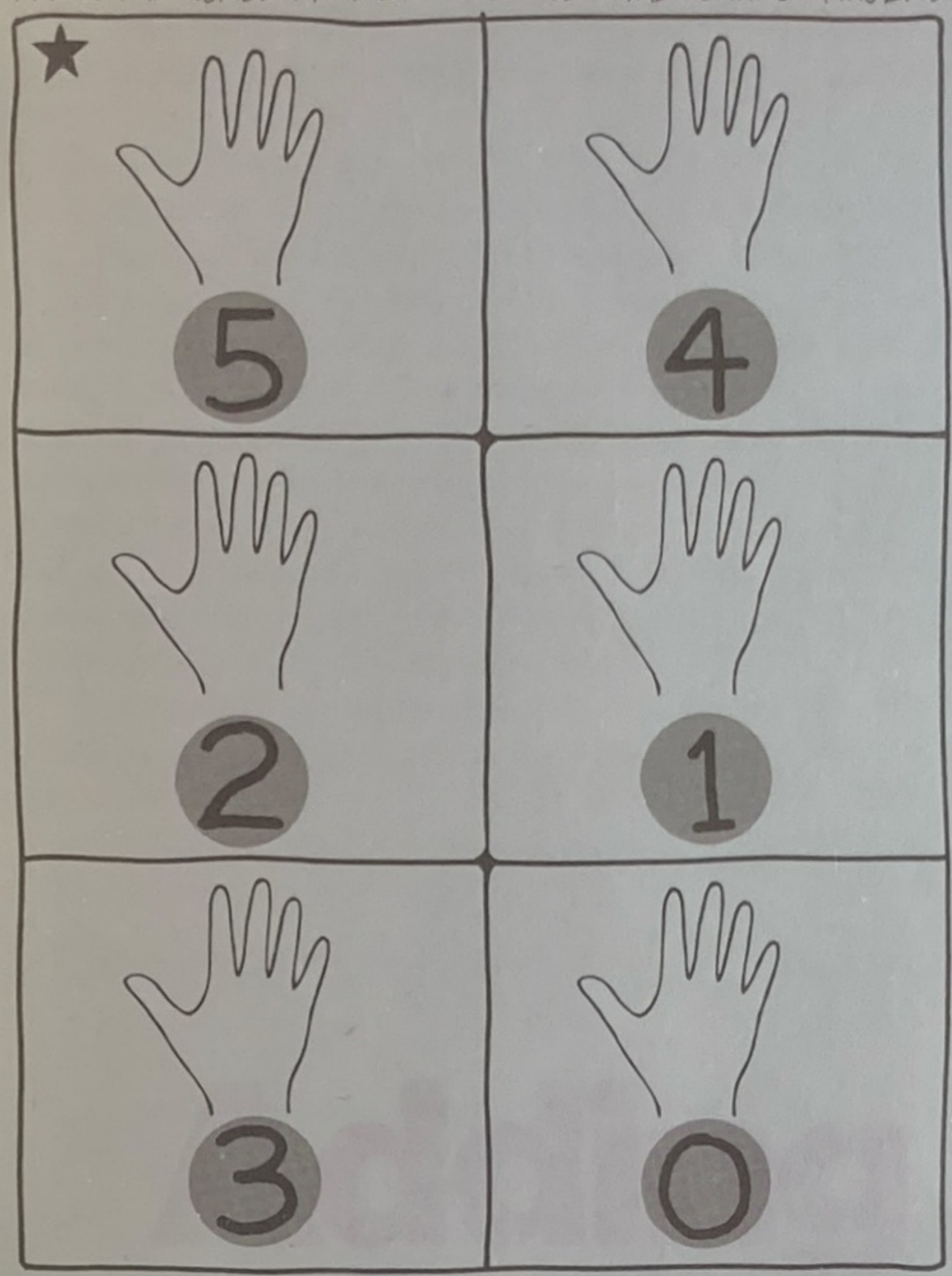
Begin by practicing the five fingerpress positions.

PRESS TWO. CLEAR YOUR FINGERS.
PRESS FOUR. CLEAR YOUR FINGERS.
PRESS FIVE. CLEAR YOUR FINGERS.
PRESS ONE. CLEAR YOUR FINGERS.
PRESS THREE. CLEAR YOUR FINGERS.
PRESS FOUR. CLEAR YOUR FINGERS.
PRESS TWO. CLEAR YOUR FINGERS.
PRESS FIVE. CLEAR YOUR FINGERS.
PRESS ONE. CLEAR YOUR FINGERS.
PRESS ZERO. CLEAR YOUR FINGERS.
PRESS THREE. CLEAR YOUR FINGERS.
PRESS FOUR. CLEAR YOUR FINGERS.
PRESS FIVE. CLEAR YOUR FINGERS.
PRESS ONE. CLEAR YOUR FINGERS.
PRESS FIVE. CLEAR YOUR FINGERS.
PRESS ZERO. CLEAR YOUR FINGERS.
PRESS THREE. CLEAR YOUR FINGERS.
PRESS FIVE. CLEAR YOUR FINGERS.

OPEN YOUR BOOKS TO PAGE 20. HOLD YOUR FINGERS IN THE READY POSITION. LOOK AT THE BOX WITH THE STAR IN THE CORNER.

WHAT IS THE NUMERAL UNDER THE HAND? Five. FIVE IS CORRECT. PRESS FIVE. Five. LOOK AT YOUR HAND. NOW LOOK AT THE HAND IN THE STARRED BOX. WHICH FINGER SHOULD BE COLORED IN TO SHOW "PRESS FIVE"? The thumb. COLOR IN THE THUMB. Do the rest of the page in the same way with the class.

PRESS THE NUMBER IN THE CIRCLE. COLOR THE CORRECT FINGERS.



20

unit

5

Adding to 5

Basal Reference

1. Sums to 9.
2. Counting to 9.
3. Numeration to 9.
4. Addition with sums to 5.

Fingermath Prerequisites

Units 1, 2, 3, and 4

*Objective 21 (TE page 51)**

The pupil can identify two distinct ways to add 1 with Fingermath.

Book Activity 21A (page 21)**
Book Activity 21B (page 22)
Book Activity 21C (page 23)

Objective 22 (TE page 54)

The pupil can direct press 1, 2, 3, 4, and 5.

Class Activity 22

Objective 23 (TE page 55)

The pupil can add 2 or 3 addends up to the sum of 5 using Fingermath.

Class Activity 23
Book Activity 23 (pages 24 and 25)

Objective 24 (TE page 57)

The pupil can add 2 one-digit numbers with sums to 5, with and without Fingermath.

Class Activity 24

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 21

The pupil can identify two distinct ways to add 1 with Fingermath.

Synopsis

This lesson may not be fully understood by the class at this stage of their development. Over the course of the year, different finger actions will be employed to establish the concept of *one more, add one,* or *plus* one.

The Rule of Thumb (see *The Complete Book of Fingermath,* page 29) clearly illustrates that when none of the right-hand four fingers is available for an additional press of 1, we must simultaneously press the thumb and clear the four fingers. Similarly, when all fingers of the right hand are established (9) and therefore not available for an additional press of 1, we must simultaneously press the left index finger (10) and clear the right hand. (See CBF pages 62 and 63.) The same right-to-left exchange mechanism comes into play for every situation in which no unit finger is available to perform the addition of 1: 19 to 20, 29 to 30, and so forth.

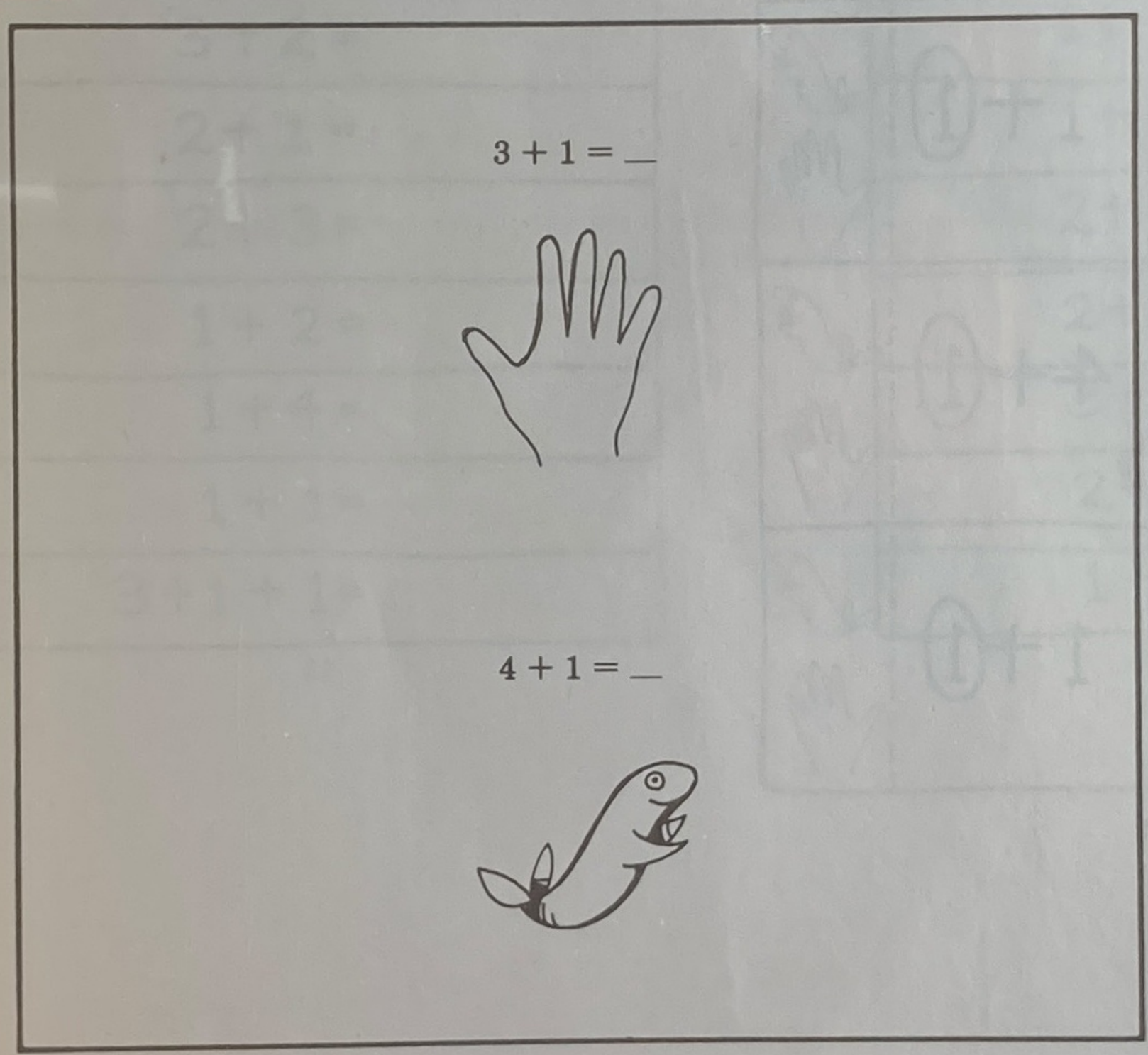
The reason for the emphasis at this stage is to develop a growing awareness in your students that the 4 to 5 exchange (the little flipper) adds 1 just as pressing a unit finger adds 1. Because of the relative complexity of this maneuver, considerable time should be spent practicing it.

Warm-up

Count by 1s to 2, 3, 4, and 5 repeatedly; direct press 1 through 5 repeatedly.

Book Activity 21A
(page 21)

Board:



Have a child come to the board and do 3 + 1 by pressing 3 and then pressing 1 more.

HOW DID YOU ADD ONE IN THIS EXAMPLE? Point to the + 1. I pressed my pinky (or words to that effect). YOU USED YOUR FINGERS, SO CIRCLE THE PICTURE OF THE HAND.

Have a second child come to the board and do 4 + 1 by pressing 4 and then 1 more.

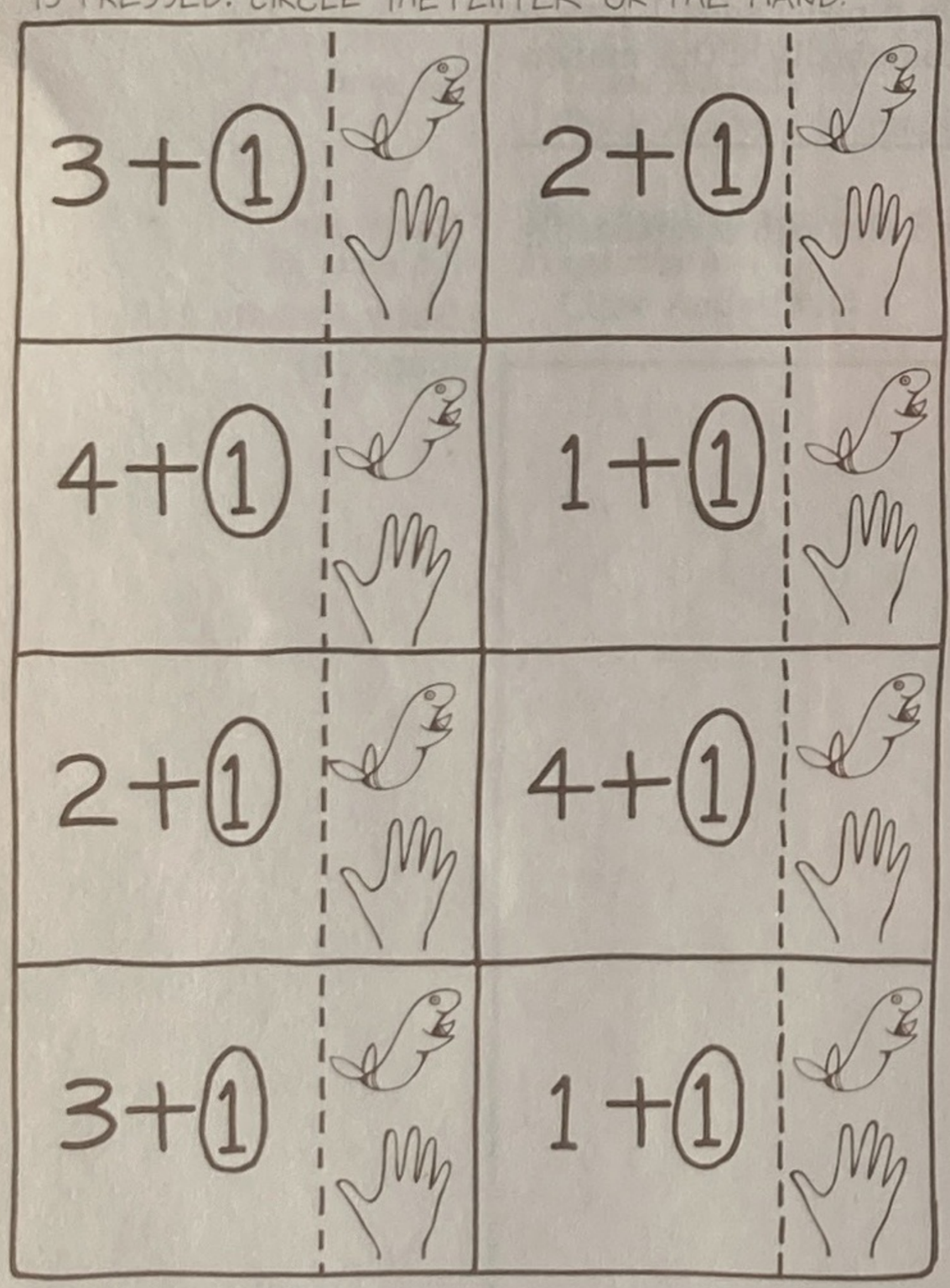
HOW DID YOU ADD ONE IN THIS EXAMPLE? Point to the + 1. I used the flipper; I made a 4 to 5 exchange (or similar words). YOU USED THE FLIPPER, SO CIRCLE THE PICTURE OF THE FLIPPER.

THAT MEANS WE CAN ADD ONE IN TWO DIFFERENT WAYS: WE CAN PRESS A FINGER OR WE CAN USE THE LITTLE FLIPPER.

TURN TO PAGE 21 IN YOUR BOOKS.

Work each of the sums with the class.

ADD EACH PAIR OF NUMBERS. OBSERVE HOW EACH 1 IS PRESSED. CIRCLE THE FLIPPER OR THE HAND.



21

Book Activity 21B (page 22) This lesson stresses again that when we add 1 to 4, we make use of the little flipper. Work these exercises with the class.

Warm-up Repeat warm-up for Book Activity 21A.

Book Activity 21C (page 23) This is a drill unit. For each exercise, have the class

1. Fingerpress the numbers.
2. Read their fingers and write the answer in the space provided.
3. Tell how they pressed the last number to be added (by fingerpressing or by the 4 to 5 exchange, the little flipper).

Check to make sure that the children can handle the 4 to 5 exchange when it occurs at the end of a count (as in 1 + 4, 2 + 3, 3 + 2).

ADD THE NUMBERS AND WRITE THE ANSWER.

2+2 =
4+1 =
3+1 =
3+2=
2+1=
2+3=
1+2=
1+4=
1+1=
3+1+1=

22

ADD THE NUMBERS AND WRITE THE ANSWER.

1+2+2=
1+1+2=
2+2+1=
1+3+1=
1+1+1=
2+1+2=
2+1+1=
3+1+1=
2+1+1=
1+2+2=

23

OBJECTIVE 22

The pupil can direct press 1, 2, 3, 4, and 5.

Synopsis Direct pressing is a regrouping maneuver just like the 4 to 5 exchange. Remember that exchanges are mental acts, which are manifested by physical actions. In direct pressing 3, for example, we are exchanging three presses of one and one and one for a single press of three fingers simultaneously. Mentally, this means we no longer think of one and one and one, but we think of an integral three immediately as we press it. This is further reinforced by changing what we say. Pressing by ones, the pupil says "One, two, three." Direct pressing should be accompanied by the pupil saying "Three."

It is important to determine whether the pupils are ready for this exchange. If some find this task difficult, allow them to continue pressing by ones.

Class Activity 22 TODAY WE WILL CONTINUE TO PRACTICE PRESSING NUMBERS DIRECT. THE FIRST WAY WE LEARNED WAS THIS. DIRECT PRESS 3. Press index, middle, and ring finger simultaneously. NOW YOU TRY IT. Three. CLEAR YOUR FINGERS.

DIRECT PRESS 2. Two. CLEAR YOUR FINGERS.

DIRECT PRESS 4. Four. CLEAR YOUR FINGERS.

PRESS 3 BY ONES. One, two, three. CLEAR YOUR FINGERS.

Run through the numbers 0 through 5 two or three times in random order.

PRESS 4 BY ONES.

DIRECT PRESS 4.

PRESS 2 BY ONES.

PRESS 5 BY ONES.

DIRECT PRESS 3.

DIRECT PRESS 5.

PRESS 3 BY ONES.

If you want more time on this activity, have one student at a time come to the front and call three numbers.

OBJECTIVE 23

The pupil can add two or three addends up to the sum of 5 using Fingermath.

Synopsis

It is necessary to pay attention to whether the pupil can keep track of finger positions when dealing with several addends.

Class Activity 23

Begin by having the class practice adding three numbers given orally, pressing one at a time.

PRESS TWO. Two. ADD ONE. One. ADD ONE MORE. One. READ YOUR FINGERS. Four. CLEAR YOUR FINGERS. Continue in the same manner using the following:

1 + 1 + 1	1 + 3 + 1
2 + 0 + 1	2 + 1 + 2
1 + 1 + 2	1 + 2 + 2
2 + 1 + 0	4 + 1 + 0
1 + 2 + 1	2 + 1 + 1
2 + 1 + 1	1 + 2 + 2

Book Activity 23
(pages 24 and 25)

Review the procedure followed in the previous lesson. Have pupils turn to page 24. Work the problem in the book with the class. Then proceed to page 25.

ADD THE NUMBERS AND WRITE THE ANSWER.

2+ 2 +1=
1+ 3 +1=
2+ 1 +2=
2+ 0 +2=
3 + 1 +1=
1+ 2 +1=
1+ 1 +2=
0+ 3+0=
4 +0+1=
1 + 3 +1=
1 + 2+2=
1 + 3+1=

24

ADD THE NUMBERS AND WRITE THE ANSWER.

1 3 +1	2 2 +1
2 1 +2	1 2 +2
2 1 +2	4 0 +1
3 1 +1	1 2 +1
2 1 +1	1 2 +1
2 2 +1	3 1 +0

25

OBJECTIVE 24

The pupil can add 2 one-digit numbers with sums to 5, with and without Fingermath.

Synopsis

Each fingerpress of a new sum is followed by a drill activity designed to help pupils to remember their basic facts.

Class Activity 24

Board:

0 + 5 = __ ; 1 + 4 = __ ; 2 + 3 = __ ; 3 + 2 = __ ; 4 + 1 = __ ; 5 + 0 = __

One child at a time comes to the board. Give her or him a sum to press and verbalize. The pupil then faces the class and gives them the same sum to press and verbalize. Answers are not written down.

Be certain that verbalization of the second addend always begins with "One."

2 + 1	3 + 1
1 + 4	1 + 1
3 + 2	1 + 4
1 + 3	2 + 3
3 + 2	4 + 1
2 + 2	2 + 2
4 + 1	3 + 1
3 + 2	1 + 4
1 + 2	3 + 2
0 + 3	5 + 0
2 + 3	0 + 4

Note that it is possible to proceed at this point directly to Unit 8 (returning then to Units 6 and 7), if this sequence better parallels basal format.

unit

6

Counting to 9

Basal Reference

1. Concrete counting experiences with quantities through 9.
2. Matching numerals with counting objects.
3. Writing numerals through 9.

Fingermath Prerequisites

Units 1, 2, and 4

*Objective 25 (TE page 61)**

The pupil can identify and match numerals, sets, and hand pictures of quantities up to 6.

Class Activity 25A
Book Activity 25A (page 26)**
Book Activity 25B (page 27)
Class Activity 25B

Objective 26 (TE page 63)

The pupil can identify and match numerals, sets, and hand pictures of quantities up to 7.

Class Activity 26A
Book Activity 26A (page 28)
Book Activity 26B (page 29)
Class Activity 26B

Objective 27 (TE page 65)

The pupil can identify and match numerals, sets, and hand pictures of quantities up to 8.

Class Activity 27A
Book Activity 27A (page 30)
Book Activity 27B (page 31)
Class Activity 27B

Objective 28 (TE page 67)

The pupil can identify and match numerals, sets, and hand pictures of quantities up to 9.

Class Activity 28A
Book Activity 28A (page 32)
Book Activity 28B (page 33)
Class Activity 28B

Objective 29 (TE page 69)

The pupil can match grouped set cards to fingerpress cards.

Class Activity 29
Game Activity 29
Book Activity 29 (page 34)

Objective 30 (TE page 71)

The pupil can tell which of two fingerpresses represents the larger (or smaller) number.

Game Activity 30A
Game Activity 30B
Book Activity 30 (page 35)

Objective 31 (TE page 73)

The pupil can direct press 5 through 9.

Class Activity 31

Objective 32 (TE page 74)

The pupil can press and read the fingerpress positions 0 through 9.

Book Activity 32A (page 36)
Book Activity 32B (page 37)
Book Activity 32C (page 38)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 25

The pupil can identify and match numerals, sets, and hand pictures of quantities up to 6.

Synopsis

This activity is not to be thought of as addition but as sequential pressing and counting. For that reason, insist that pupils press all numbers finger by finger, one by one.

Warm-up

Unit counting to 5; 4 to 5 exchange.

Class Activity 25A

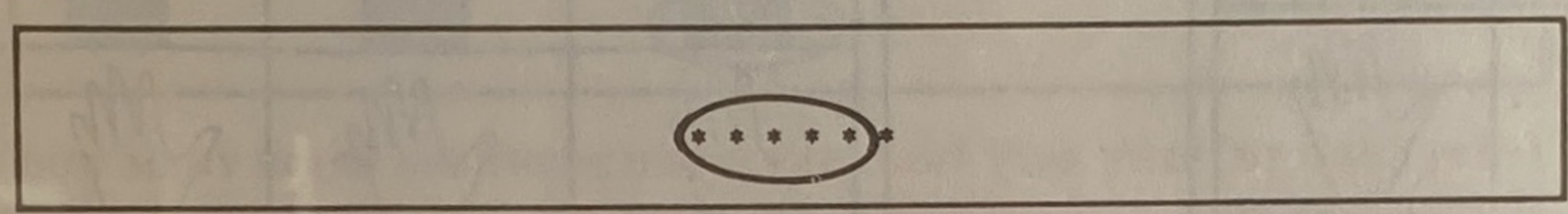
Board:

* * * * *	1
* * *	2
* * * *	3
* *	4
*	5

Have a volunteer come to the board and point to one star. Next have the volunteer circle the numeral 1 and then press 1. In like manner have students do 2, 3, 4, and 5.

Book Activity 25A
(page 26)

Board:

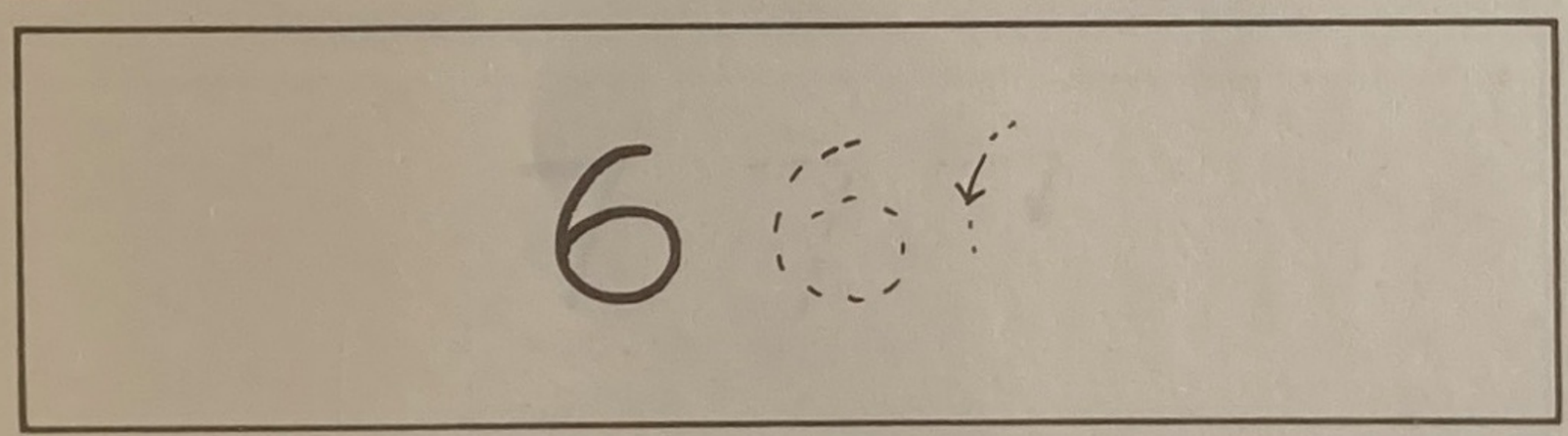


HOW MANY STARS ARE THERE INSIDE THE LOOP? Five. THEN ONE BY ONE PRESS FIVE. One, two, three, four, five. GOOD. HOLD ONTO THE FIVE. NOW TELL ME HOW MANY STARS THERE ARE OUTSIDE THE LOOP. One. PRESS ONE MORE. One. READ YOUR FINGERS. Six. SO, HOW MANY STARS ARE THERE ALTOGETHER? Six. CLEAR YOUR FINGERS. NOW TURN TO PAGE 26.

Help the class to get started on each of the two activities.

Book Activity 25B
(page 27)

Board:

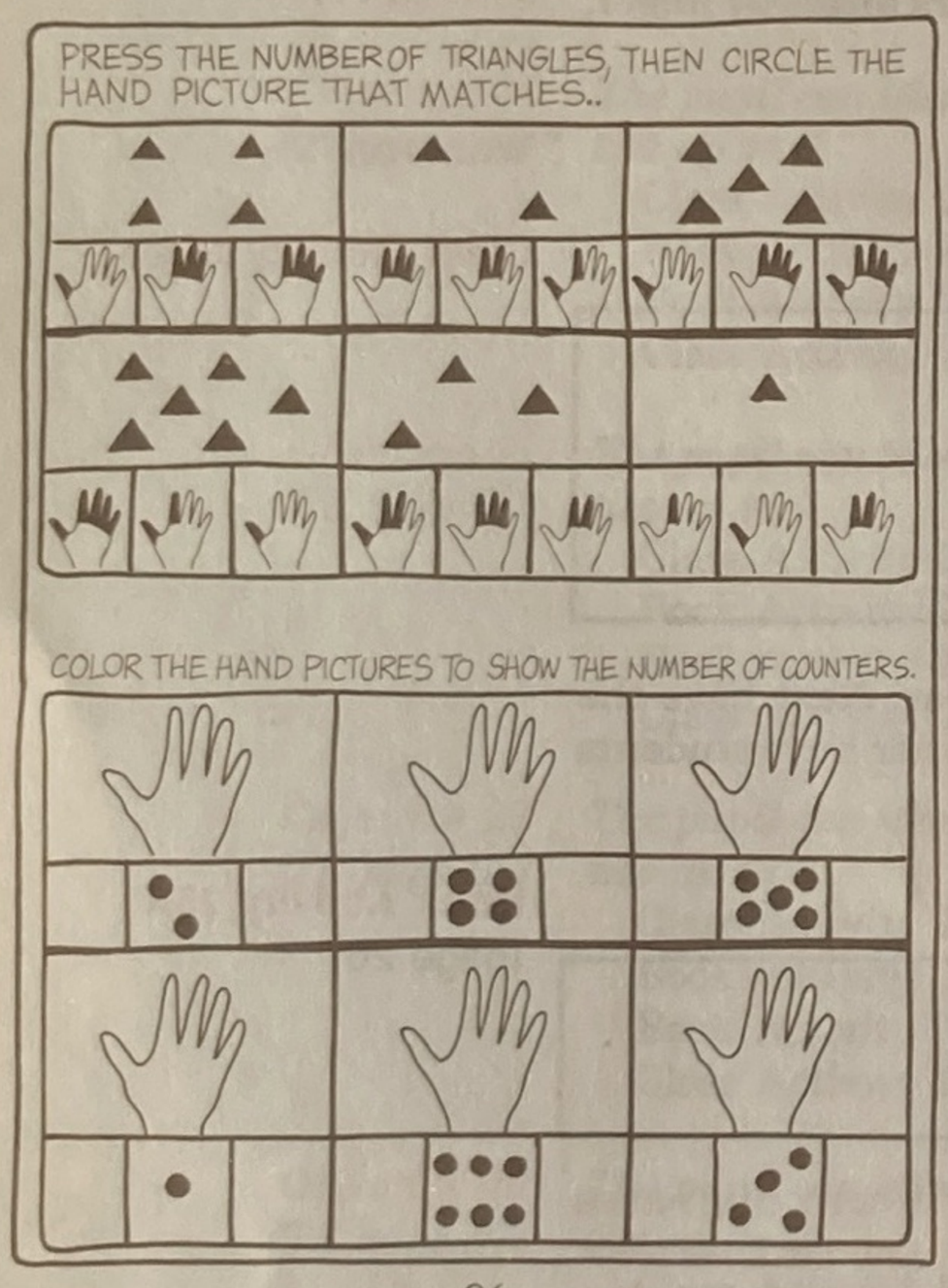


Begin by having volunteers come to the board, trace the numeral, and then press 6 on their fingers.

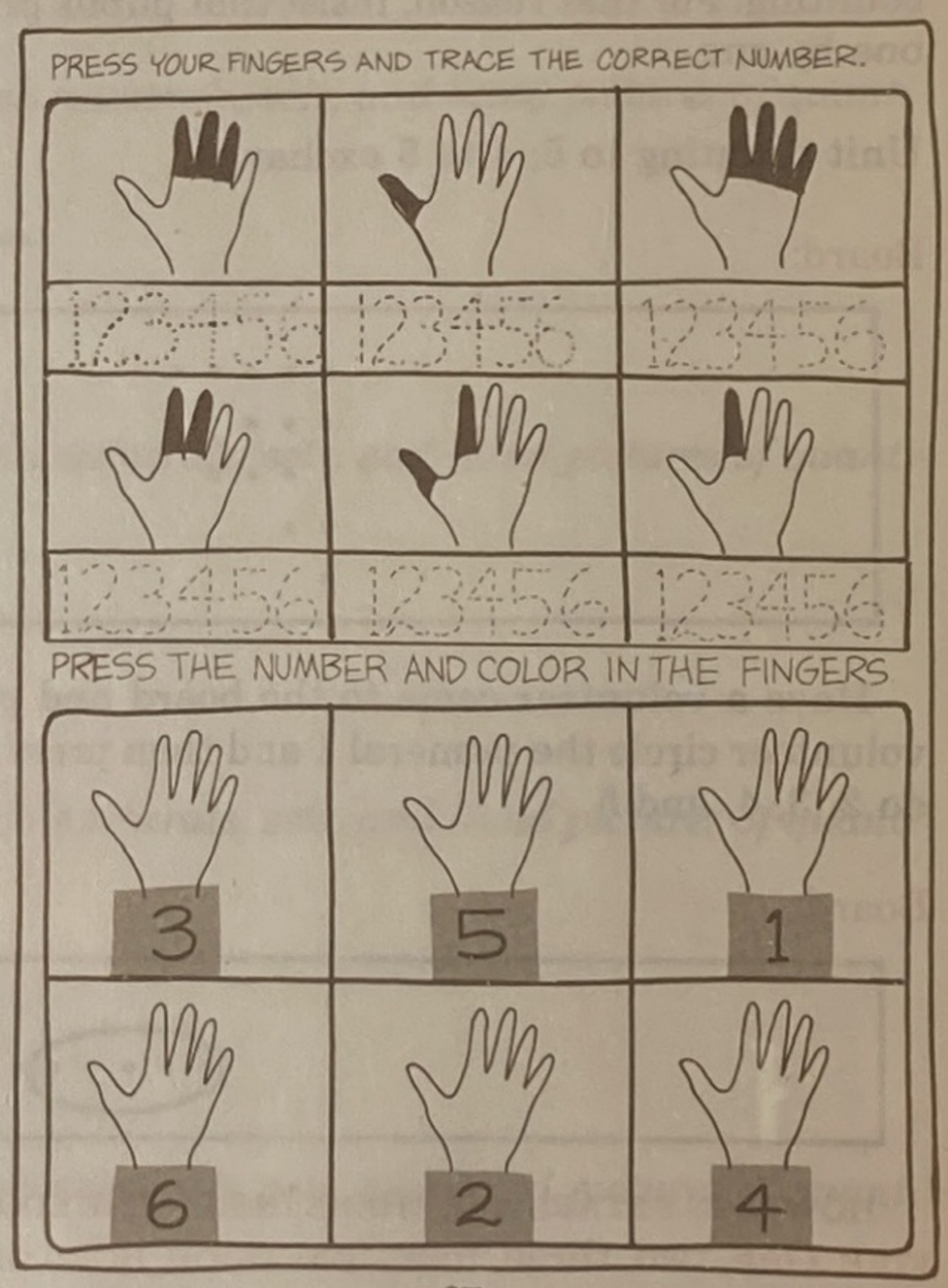
Then have pupils turn to page 27. Help the class get started on each activity. In all cases have the children press on their own fingers the number shown.

Press Game

Materials: A set of large flash cards for the numbers 0, 1, 2, 3, 4, 5, 6. This is a review activity. Go over each flash card several times visually and orally. Pupils are to press to the number shown or called and verbalize that number.



26



27

OBJECTIVE 26

The pupil can identify and match numerals, sets, and hand pictures of quantities up to 7.

Unit counting and direct pressing to 6 (Objective 25).

Warm-up

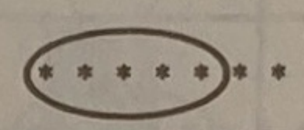
Book Activity 26A
(page 28)

Board:

* * * * * *	1
* * * * *	2
* * *	3
* * * *	4
* *	5
*	6

Have a volunteer come to the board and point to one star. Next have the volunteer circle the numeral 1 and then press 1. In like manner have pupils do 2, 3, 4, 5, and 6.

Board:



HOW MANY STARS ARE THERE INSIDE THE LOOP? Five. THEN, BY ONES, PRESS FIVE. One, two, three, four, five. GOOD. HOLD ONTO THE FIVE. NOW TELL ME HOW MANY STARS ARE THERE OUTSIDE THE LOOP. Two. THEN, ONE BY ONE, PRESS TWO MORE. One, two. READ YOUR FINGERS. Seven. SO, HOW MANY STARS ARE THERE ALTOGETHER? Seven. CLEAR YOUR FINGERS. NOW TURN TO PAGE 28.

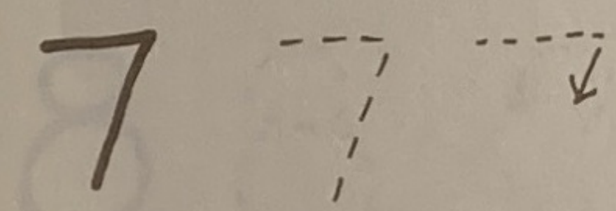
Help the class to get started on each of the activities.

Unit counting to 7; direct pressing to 6.

Warm-up

Book Activity 26B
(page 29)

Board:



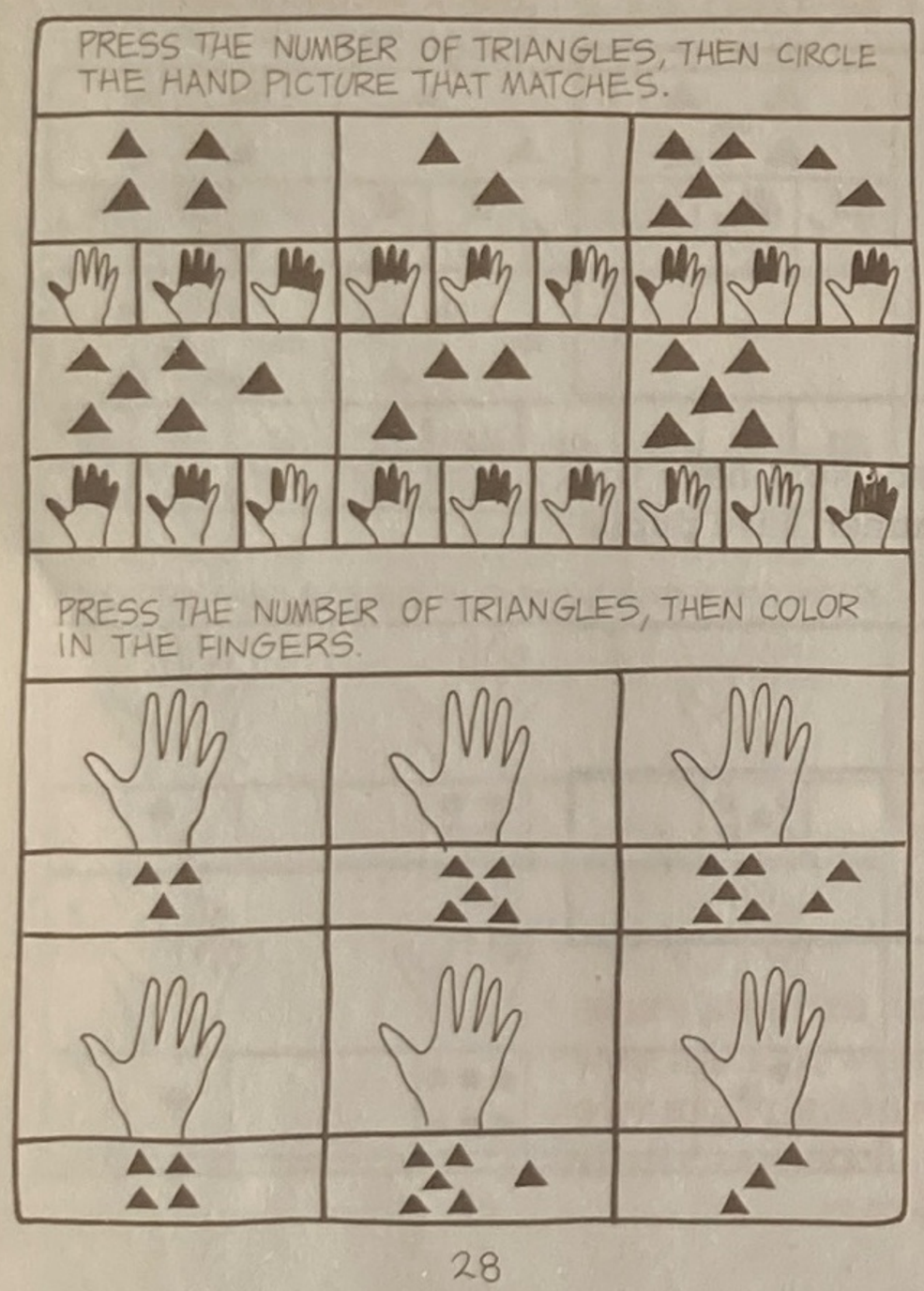
Begin by having volunteers come to the board, trace the numeral, and then press 7 on their fingers.

Then turn to page 29. Help the class get started on each activity. In all cases have the pupils press the numbers being shown in the drawings.

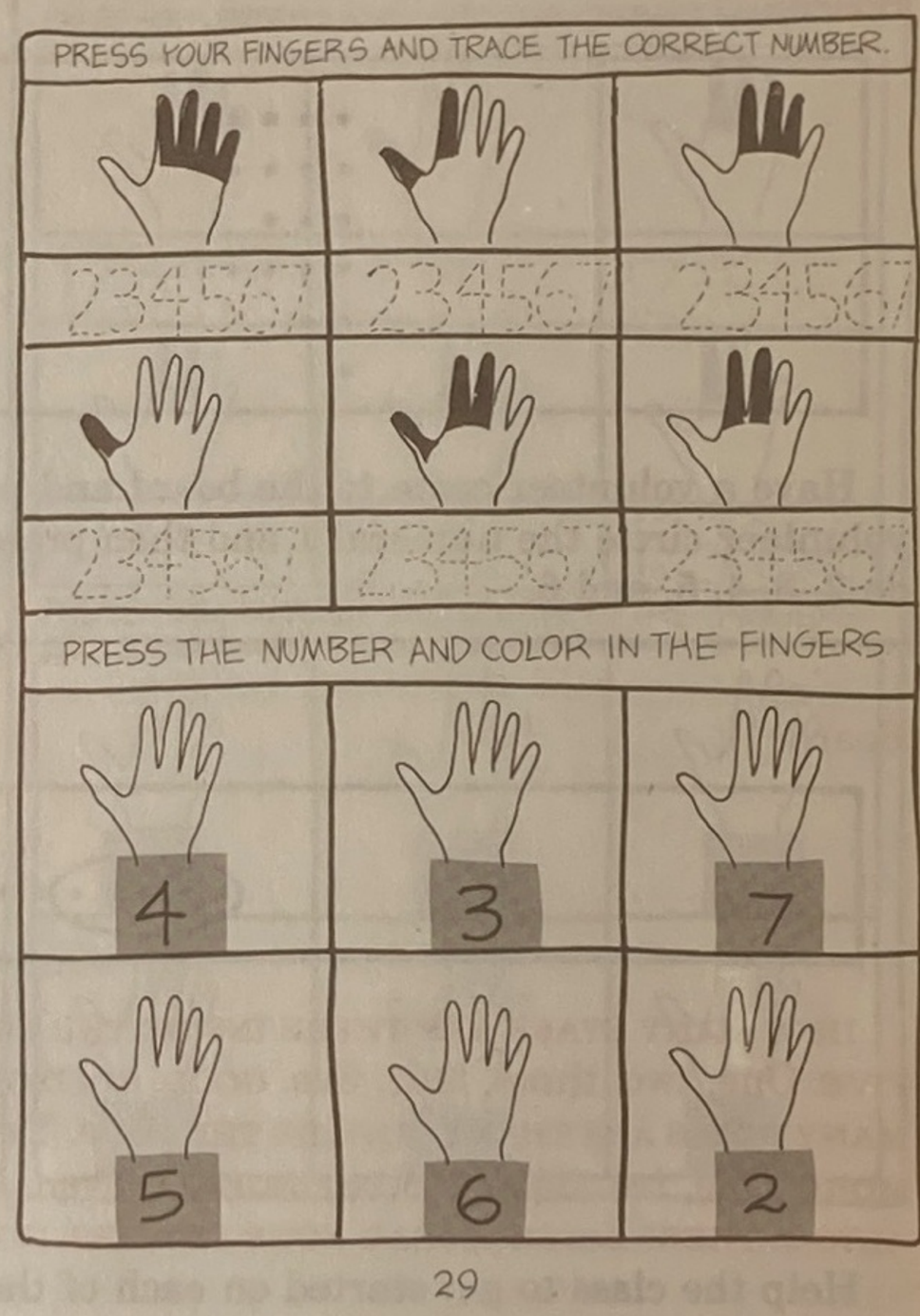
Class Activity 26B PRESS GAME

Materials: A set of large flash cards for the numbers 0 through 7.

Another review activity. Go over each flash card several times visually and orally. Pupils are to press to the number shown or called and verbalize that number.



28



29

OBJECTIVE 27

The pupil can identify and match numerals, sets, and hand pictures of quantities up to 8.

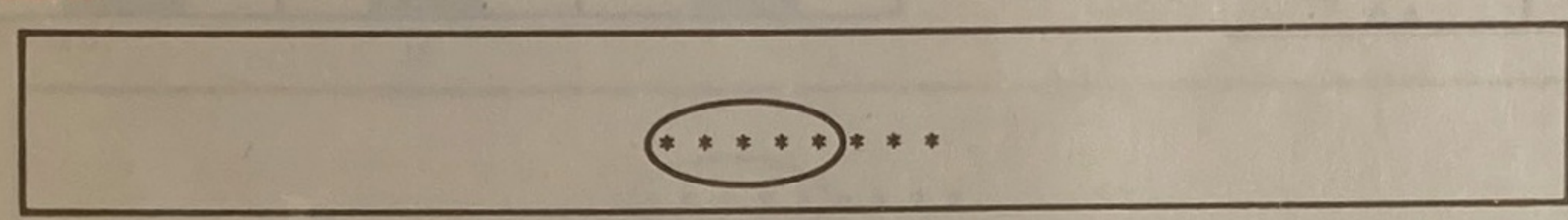
Unit counting to 7. **Warm-up**

Board: **Class Activity 27A**

* * * * * * *	1
* * * * *	2
* * *	3
* * * *	4
* *	5
*	6
* * * * * *	7

Have a volunteer come to the board and point to one star. Next have the volunteer circle the numeral 1 and then press 1. In a like manner have students do 2, 3, 4, 5, 6, and 7.

Board: **Book Activity 27A** (page 30)

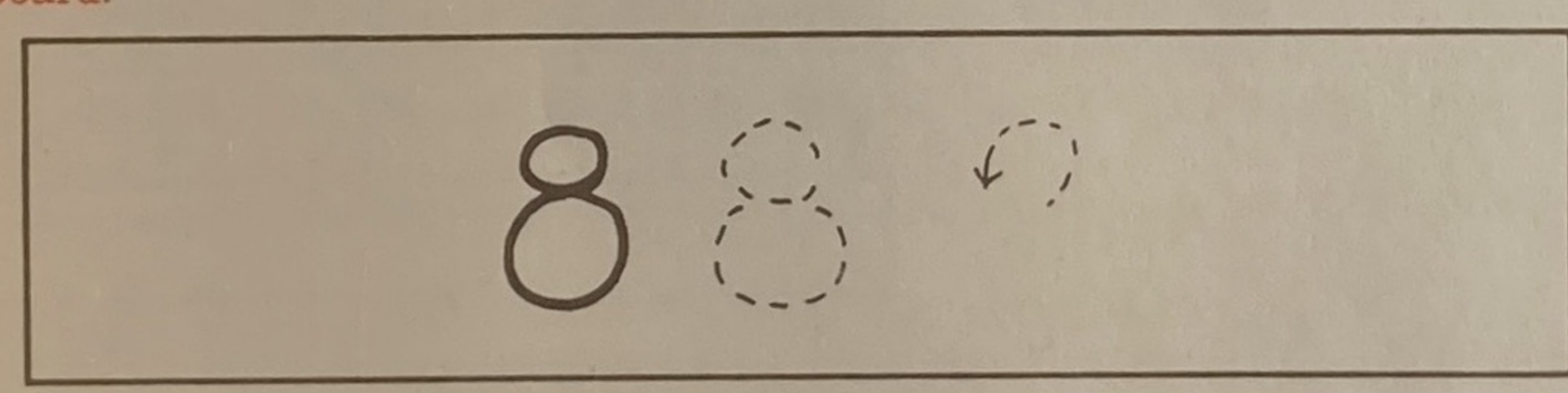


HOW MANY STARS ARE THERE INSIDE THE LOOP? Five. THEN, BY ONES, PRESS FIVE. One, two, three, four, five. GOOD. HOLD ONTO THE FIVE. NOW TELL ME HOW MANY STARS ARE THERE OUTSIDE THE LOOP. Three. THEN, ONE BY ONE, PRESS THREE MORE. One, two, three. READ YOUR FINGERS. Eight. SO, HOW MANY STARS ARE THERE ALTOGETHER? Eight. CLEAR YOUR FINGERS. NOW TURN TO PAGE 30.

Help the class to get started on each of the two activities.

Unit counting to 8; direct pressing to 8. **Warm-up**

Board: **Book Activity 27B** (page 31)



Begin by having volunteers come to the board, trace the numeral, and then press 8 on their fingers.

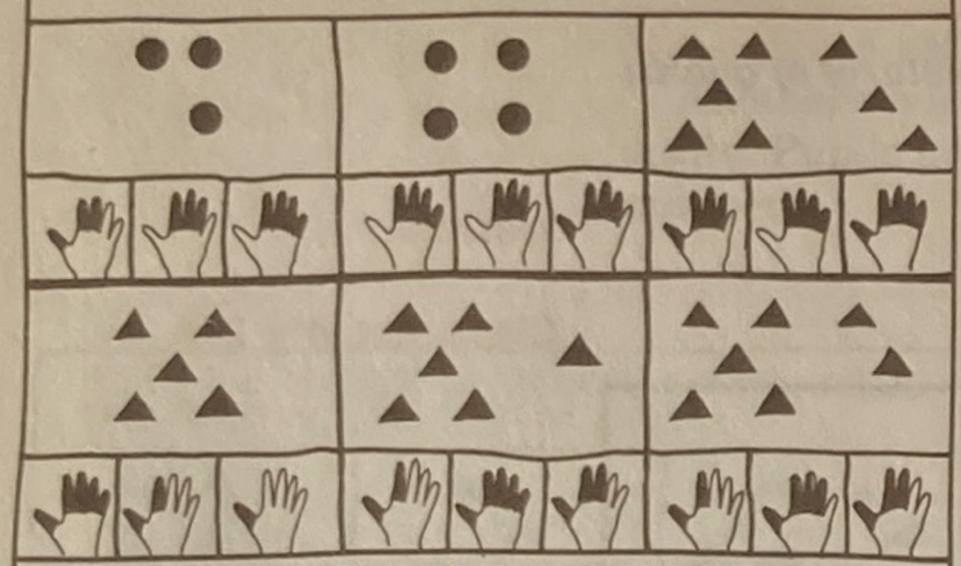
Then turn to page 31. Help the class get started on each activity. In all cases have the pupils press the numbers being shown in the drawings.

PRESS GAME **Class Activity 27B**

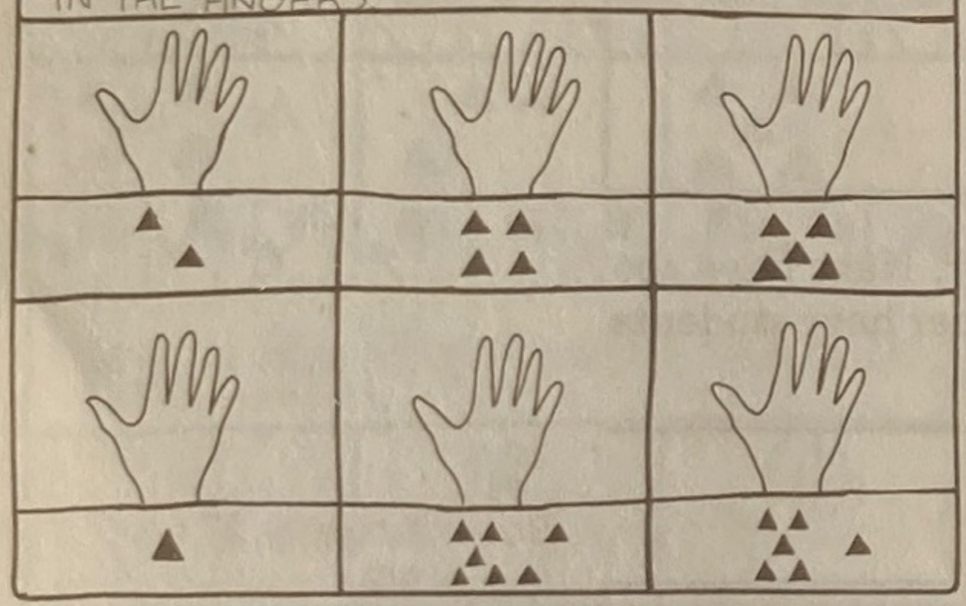
Materials: A set of large flash cards for the numbers 0 through 8.

This is another review activity. Go over each flash card several times visually and orally. Pupils are to press to the number shown or called and verbalize that number.

PRESS THE NUMBER OF DOTS OR TRIANGLES, THEN CIRCLE THE HAND PICTURE THAT MATCHES.

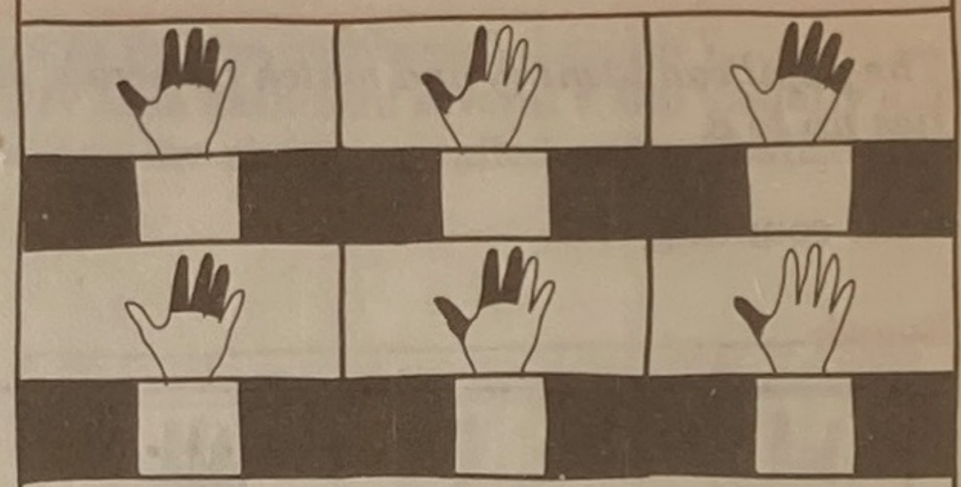


PRESS THE NUMBER OF TRIANGLES, THEN COLOR IN THE FINGERS.

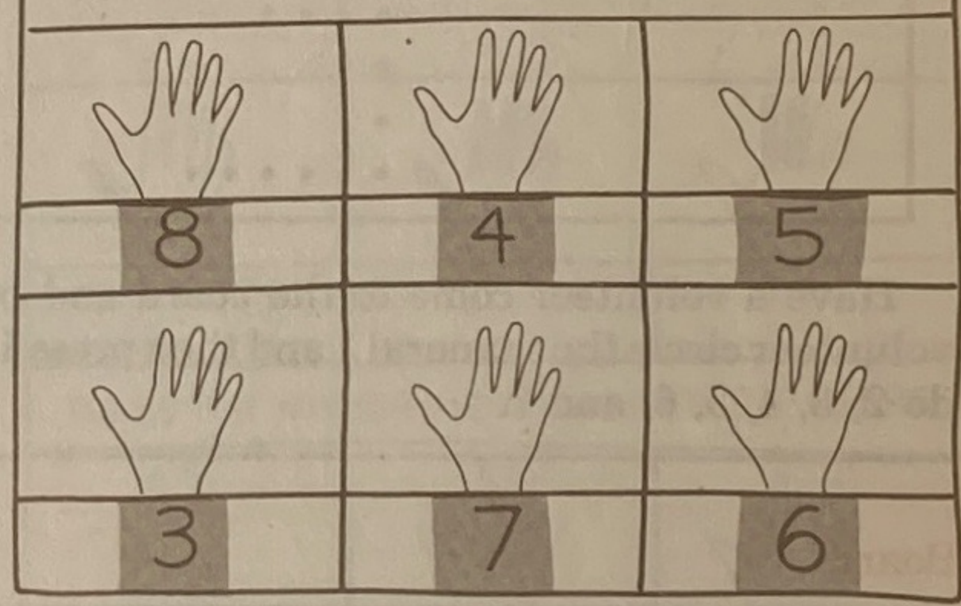


30

PRESS YOUR FINGERS AND WRITE THE NUMBERS.



PRESS THE NUMBER AND COLOR IN THE FINGERS.



31

OBJECTIVE 28

The pupil can identify and match numerals, sets, and hand pictures of quantities up to 9.

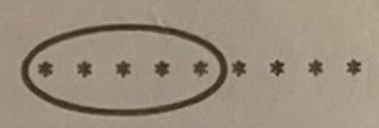
Unit counting to 8 (Objective 27). **Warm-up**

Board: **Class Activity 28A**

* * * * * *	1
* * * * *	2
* * * * * * *	3
* * *	4
* * * *	5
* * * * * * * *	6
* *	7
*	8

Have a volunteer come to the board and point to one star. Next have the volunteer circle the numeral 1 and then press 1. In a like manner have students do 2, 3, 4, 5, 6, 7, and 8.

Board: **Book Activity 28A** (page 32)

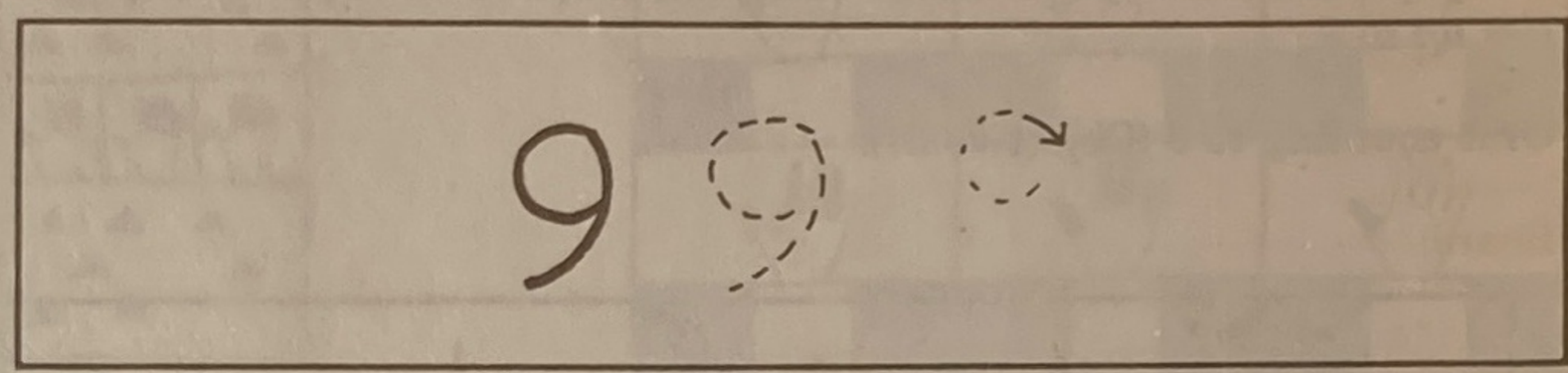


HOW MANY STARS ARE THERE INSIDE THE LOOP? Five. THEN, BY ONES, PRESS FIVE. One, two, three, four, five. GOOD. HOLD ONTO THE FIVE. NOW TELL ME HOW MANY STARS ARE THERE OUTSIDE THE LOOP. Four. THEN, ONE BY ONE, PRESS FOUR MORE. One, two, three, four. READ YOUR FINGERS. Nine. SO, HOW MANY STARS ARE THERE ALTOGETHER? Nine. CLEAR YOUR FINGERS. NOW TURN TO PAGE 32.

Help the class to get started on each of the activities.

Warm-up Unit counting to 9.

Book Activity 28B (page 33) Board:



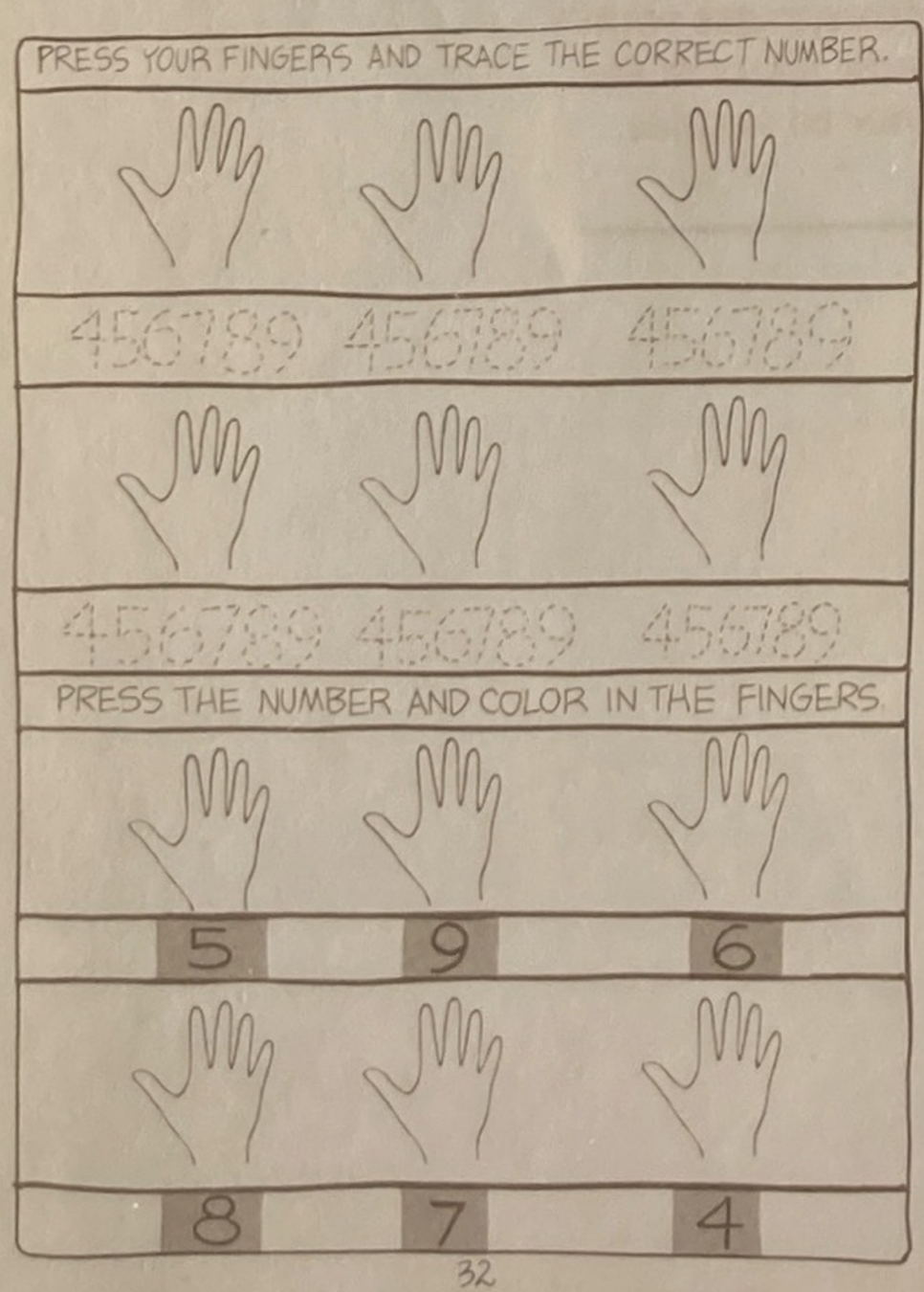
Begin by having volunteers come to the board, trace the numeral, and then press 9 on their fingers.

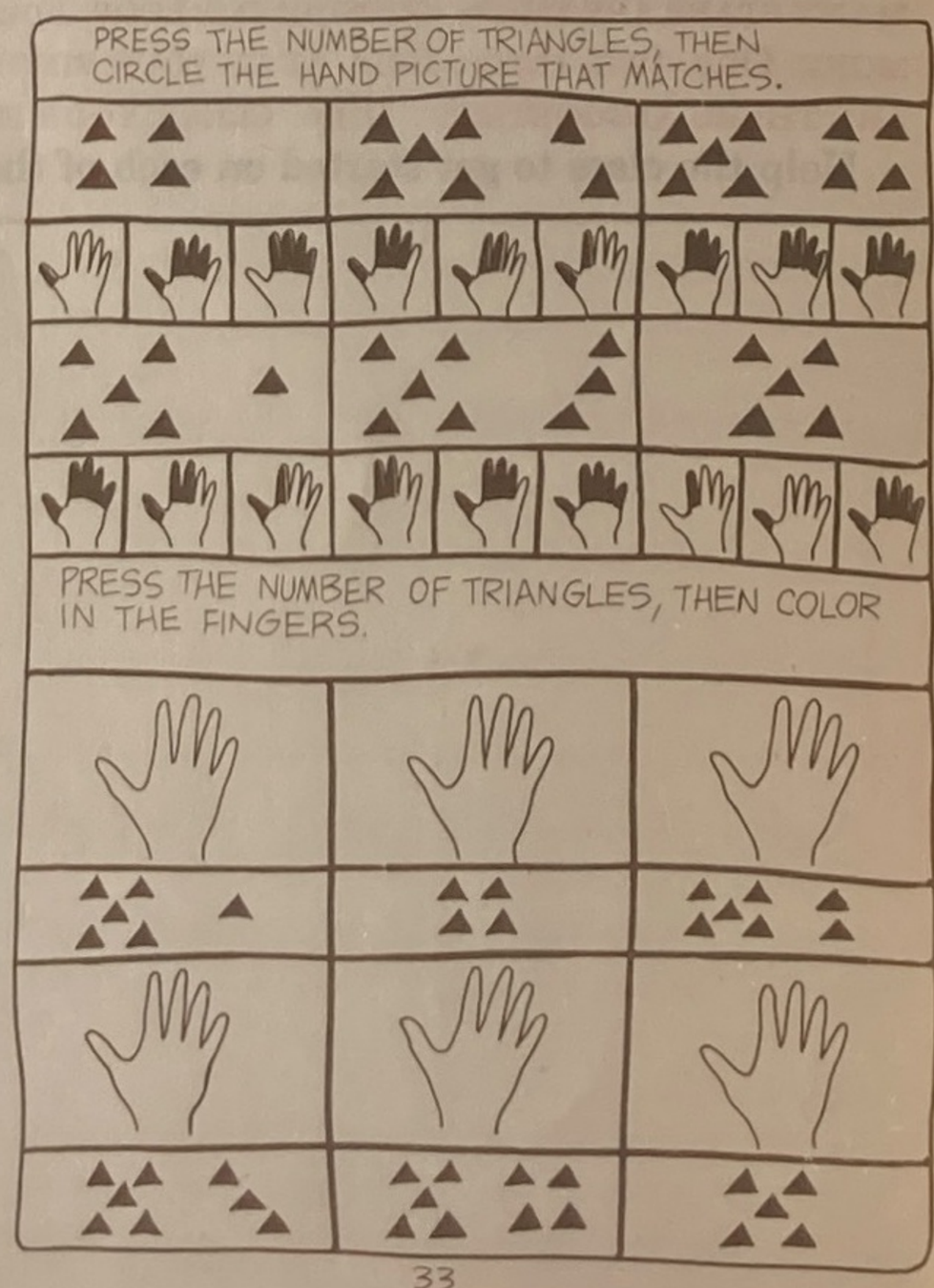
Turn to page 33. Help the class get started on each activity. In all cases have the students press on their own fingers the number shown.

Class Activity 28B PRESS GAME

Materials: A set of large flash cards for the numbers 0 through 9.

This is another review activity. Have pupils press each number. Repeat each card several times. Then repeat the exercise, calling numbers orally, at random.





OBJECTIVE 29

The pupil can match grouped set cards to fingerpress cards.

Synopsis

This objective links grouping of sets to grouping of fingers. Book activities should be supplemented with repeated fingerpressing.

Warm-up

Direct press 1 through 9; unit count to 9.

Class Activity 29

Board:

A picture of a set card with eight counters on it.

Materials: Each student should have a set of set cards for 0 through 9.

I WANT YOU TO PICK OUT ALL THE SET CARDS THAT HAVE FIVE OR MORE COUNTERS ON THEM. Wait for this activity to be completed. TAKE OUT A PENCIL. PICK OUT A SET CARD AND CAREFULLY CIRCLE FIVE COUNTERS, LIKE THIS. Demonstrate on the board.

Have the class circle five counters on every set card with five or more counters on it. Go around and check. After pupils have circled a set of five on each of the designated cards, continue as follows:

I WANT YOU TO TAKE OUT THE FINGERPRESS HAND CARDS FOR ZERO THROUGH NINE AND PUT THEM ON THE RIGHT-HAND CORNER OF YOUR DESK FOR A MOMENT. NOW I WANT YOU TO LINE UP YOUR SET CARDS IN A ROW SO THAT THEY READ *ZERO, ONE, TWO, THREE, FOUR, FIVE, SIX, SEVEN, EIGHT, NINE.*

Go around and check. Next, have the children line up their fingerpress hand cards in a row under the set cards in the same sequence. Finally, have them line up their numeral cards under the hand cards in the same order.

Game Activity 29

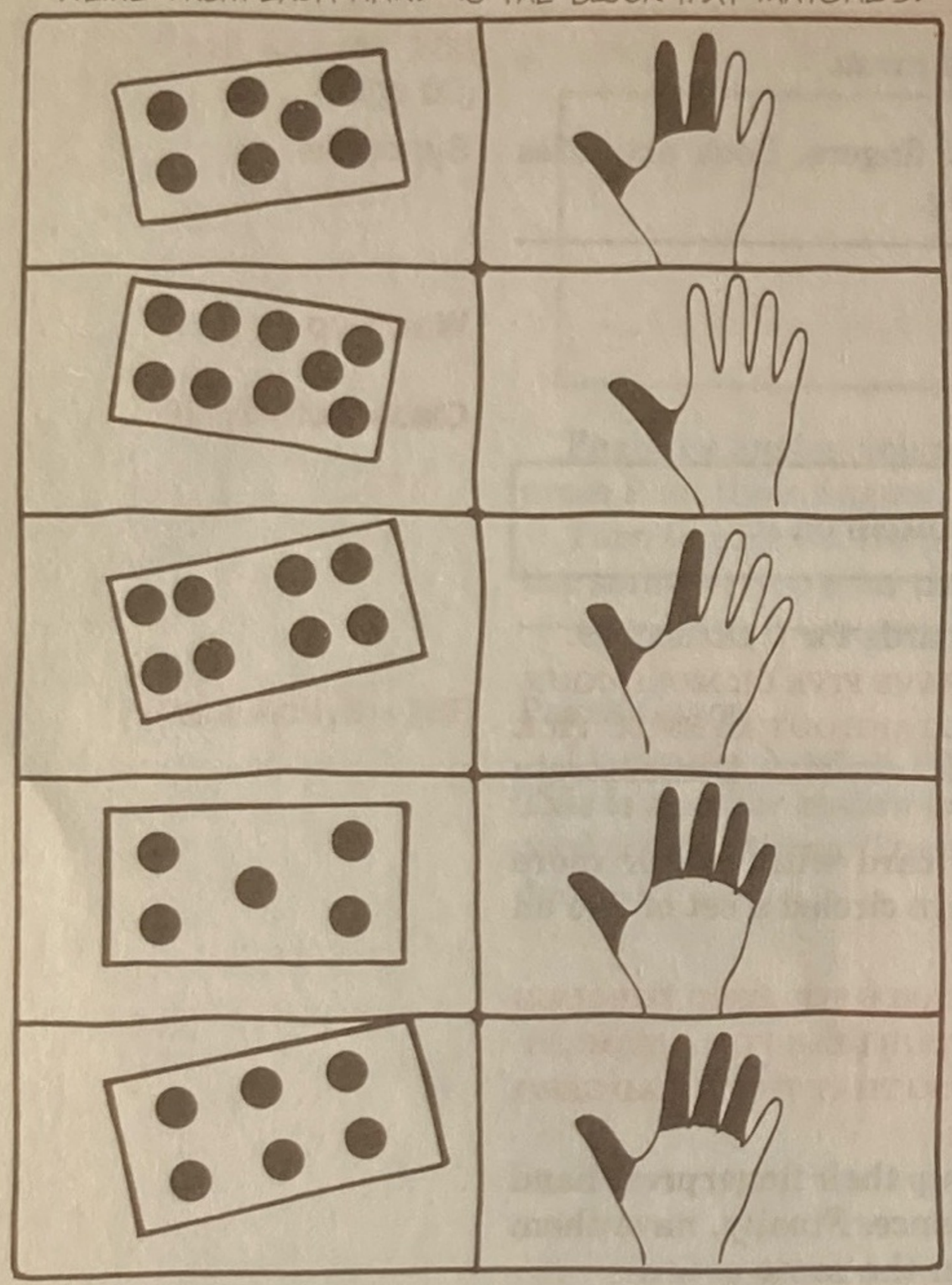
Materials: The pupils use their 0 through 9 set cards and their 0 through 9 fingerpress card.

Have the children pair off. One pupil gets only the set cards (two sets of 0 through 9 set cards), while the other gets all the fingerpress cards. Both children shuffle their cards and place them face down. They simultaneously turn over the top card. Each pupil presses the number turned over. The student with the larger card says "larger" and the student with the smaller card says "smaller," or they both say "equal." Both cards go into a pile in the middle. Finally, they sort out the cards in the pile and return them to their original owners.

Book Activity 29
(page 34)

TURN TO PAGE 34. LOOK AT THE FIRST SET CARD ON THIS PAGE. HOW MANY COUNTERS ARE ON THE SET CARD? Seven. NOW FIND A HAND THAT SHOWS A HANDPRESS OF SEVEN. DRAW A LINE FROM THE SET CARD FOR SEVEN TO THE HAND THAT SHOWS SEVEN. Do the rest in the same way.

PRESS THE AMOUNT SHOWN ON EACH HAND, DRAW A LINE FROM EACH HAND TO THE BLOCK THAT MATCHES.



34

OBJECTIVE 30

The pupil can tell which of two fingerpresses represents the larger (or smaller) number.

Synopsis

It is important that children think of numbers in relation to their relative size.

This activity helps pupils to associate the fingerpress with the quantity it represents.

Game Activity 30A

Materials: 8 X 10 tagboard fingerpress cards, 0 through 9, for use at the front of the room.

Vocabulary

Larger, smaller, more, less

Place one hand picture on the chalk tray. Then ask a pupil to pick up another hand picture and place it beside the first, to the left if it is less, and to the right if it is greater than the one already at the board.

After one child has taken a turn, pick up the two cards and start anew, continuing until everyone has had a turn.

Game Activity 30B

Materials: Each pupil should have two sets of nine hand cards, 1 through 9.

The children are paired. Each child shuffles his or her own cards and then uses only the top 10 cards, which are placed face down on the table. The players turn over their top cards simultaneously. The card with the higher fingerpress value on it wins (matching cards are reshuffled) and the pupil having that card wins both cards. The game can be ended either by setting a time limit or by letting one child run out of cards.

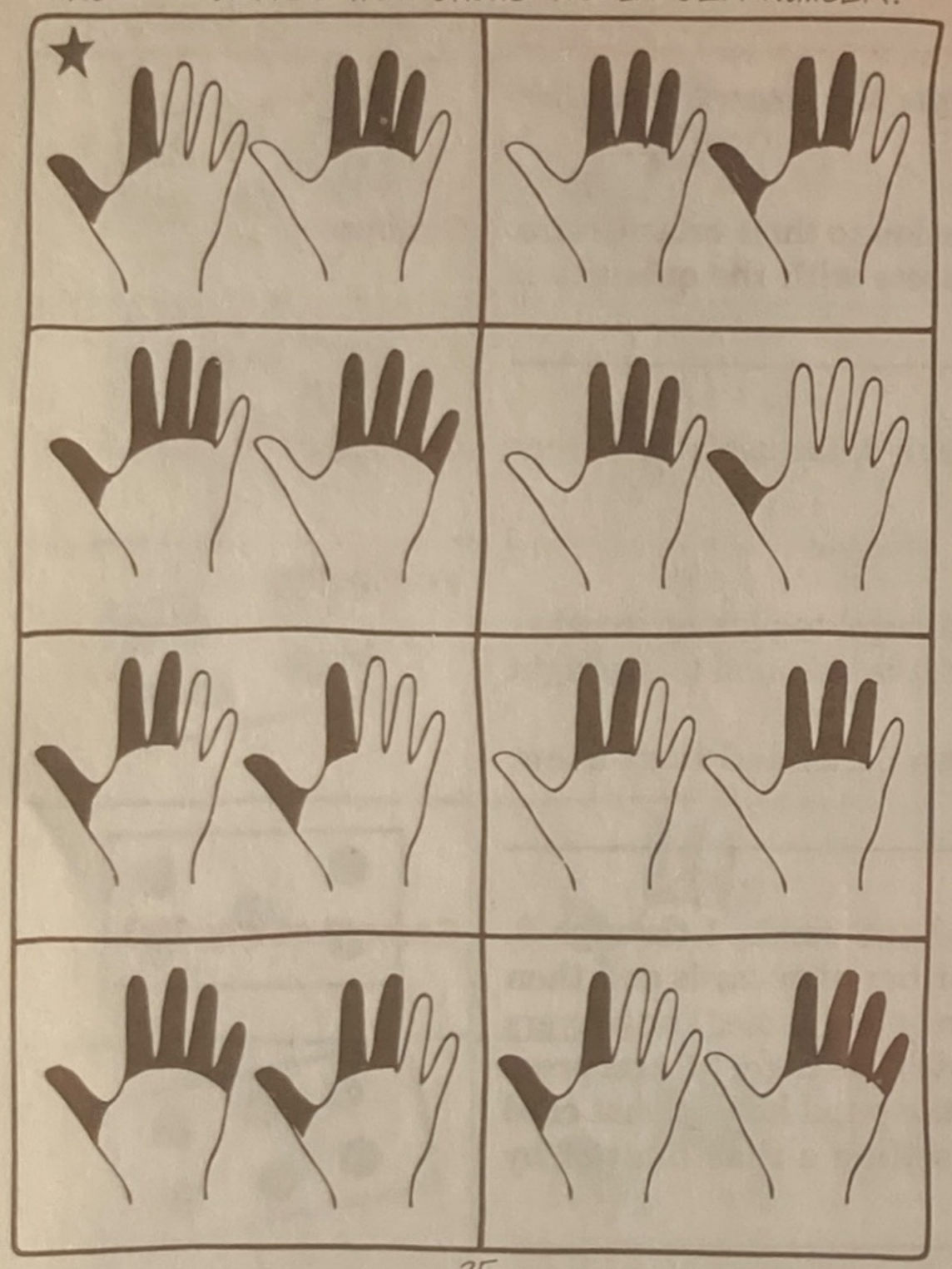
Book Activity 30
(page 35)

First hold up two randomly selected 8 X 10 hand cards side by side in front of class. Ask a child to come forward. WHICH HAND SHOWS THE LARGER NUMBER?

Child points to the correct card. Repeat this routine two or three times with different children and then ask the class to turn to page 35 in the book.

LOOK AT THE BOX WITH THE STAR IN THE CORNER. WHAT DOES THE FIRST HAND READ? Six. WHAT DOES THE SECOND HAND READ? Three. WHICH HAND SHOWS THE LARGER NUMBER, THE FIRST OR THE SECOND? The first. CIRCLE THAT HAND. Do the remaining boxes in the same way.

CIRCLE THE HAND THAT SHOWS THE LARGER NUMBER.



35

OBJECTIVE 31

The pupil can direct press 5 through 9.

Synopsis

Having recently learned to use the thumb as a 5s counter, the pupil is now ready for direct pressing of 5, 6, 7, 8, and 9.

Warm-up

Unit counting to 9; 4 to 5 exchange.

Class Activity 31

Materials: Flash cards for the numerals 0 through 9.

TODAY WE ARE GOING TO PLAY THE PRESS GAME AGAIN. IF I SAY PRESS FIVE, WHO CAN TELL ME WHAT TO DO? Press my thumb. EVERYONE PRESS FIVE. Five. CLEAR YOUR FINGERS. IF I SAY "PRESS SIX," WHAT DO YOU DO? I press my thumb and my index finger. EVERYONE PRESS SIX. Six. CLEAR YOUR FINGERS.

Next, have the pupils press and clear numbers as follows:

PRESS ONE. CLEAR YOUR FINGERS.
PRESS SIX. CLEAR YOUR FINGERS.
PRESS TWO. CLEAR YOUR FINGERS.
PRESS SEVEN. CLEAR YOUR FINGERS.
PRESS THREE. CLEAR YOUR FINGERS.
PRESS EIGHT. CLEAR YOUR FINGERS.
PRESS FOUR. CLEAR YOUR FINGERS.
PRESS NINE. CLEAR YOUR FINGERS.

Now have the children press and clear the numbers in random order at least twice for each of the numbers 0 through 9. Finally, use the flash cards, so that the students work with numbers visually.

OBJECTIVE 32

The pupil can press and read the fingerpress positions 0 through 9.

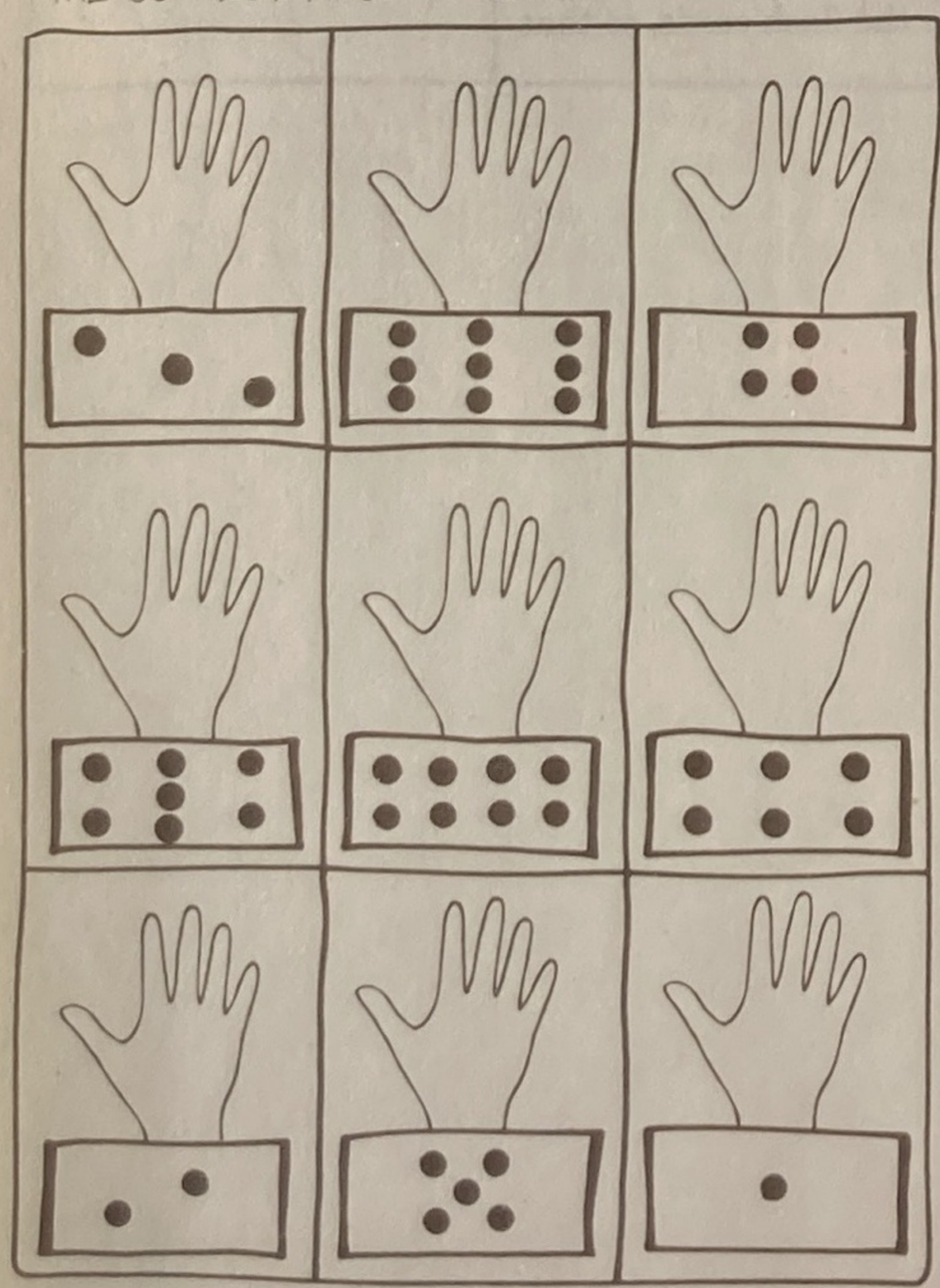
Synopsis This set of activities acts as a review, and as a reinforcement of the work of this unit. Look for pupils who don't seem to know why they are doing what they are doing.

Book Activity 32A (page 36) Have class turn to page 36. After working the first two problems with the class, allow them to try the rest without assistance.

LOOK AT THE FIRST PICTURE. WHAT NUMBER IS REPRESENTED BY THE SET BELOW THE HAND? Three. PRESS THREE ON YOUR FINGERS. WHAT CAN WE DO TO SHOW THREE ON THE FINGERPRESS HAND? Color in the first three fingers (or the like). DO IT.

NOW LOOK AT THE SECOND PICTURE. WHAT NUMBER IS REPRESENTED BY THE SET BELOW THE HAND? Nine. PRESS NINE. One, two, three, four, five, six, seven, eight, nine. WHICH FINGERS DO WE COLOR IN TO SHOW NINE? The thumb, index, middle, ring, and pinky fingers. DO IT. NOW I WANT YOU TO DO THE REST OF THESE EXERCISES IN THE SAME WAY.

PRESS THE NUMBER OF DOTS SHOWN. COLOR THE CORRECT FINGERS TO MATCH.



36

Help the children with the first example. Have them draw a line from the hand picture to the numeral that stands for that fingerpress.

Book Activity 32B (page 37)

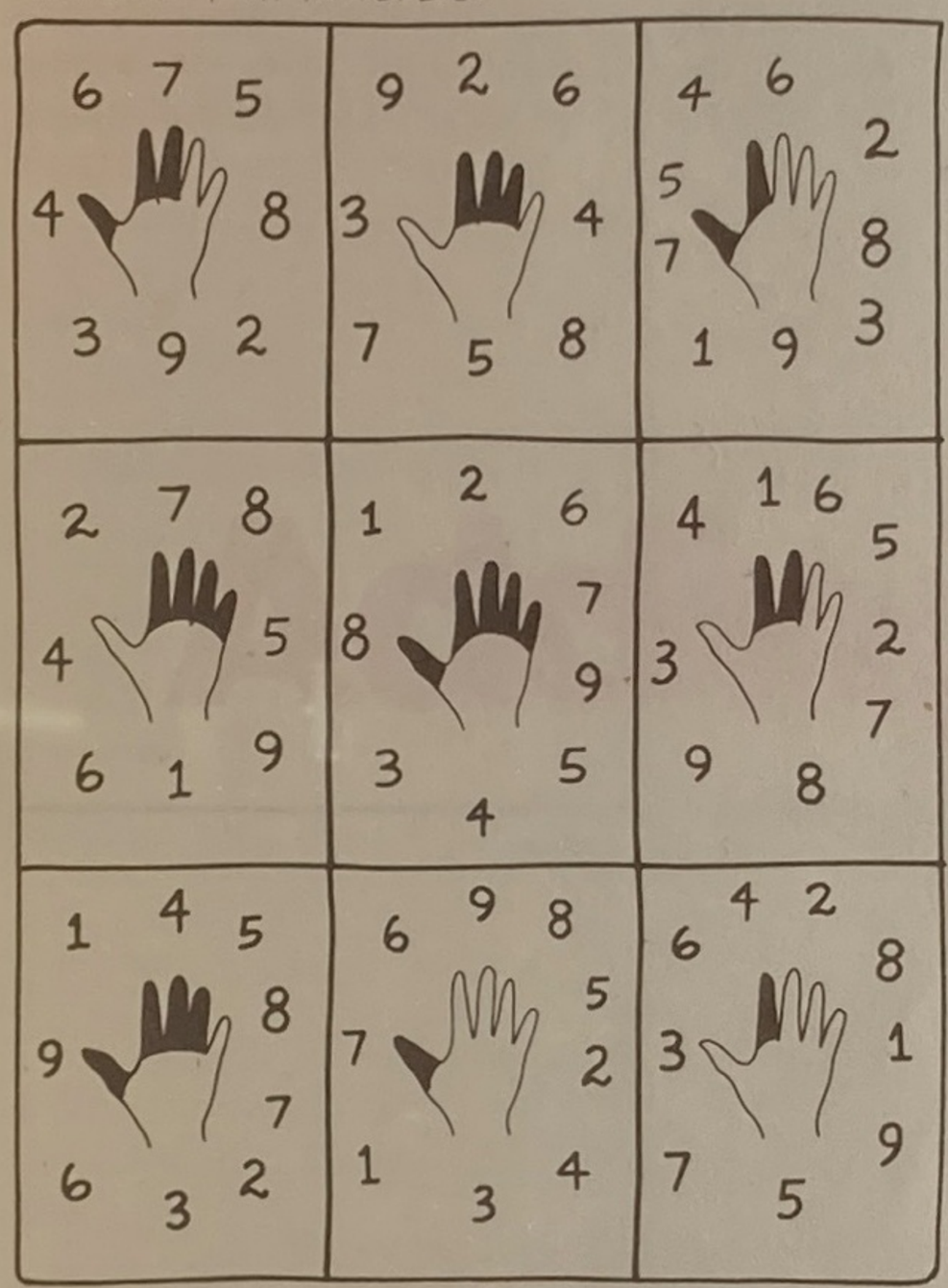
LOOK AT THE FIRST BOX. WHAT NUMBER IS SHOWN ON THE HAND? Seven. THEN FIND THE NUMERAL SEVEN AND CIRCLE IT. Go around the room and check. Let the class work the rest alone.

Help the children with the first example. Have them darken in fingers pressed to represent four.

Book Activity 32C (page 38)

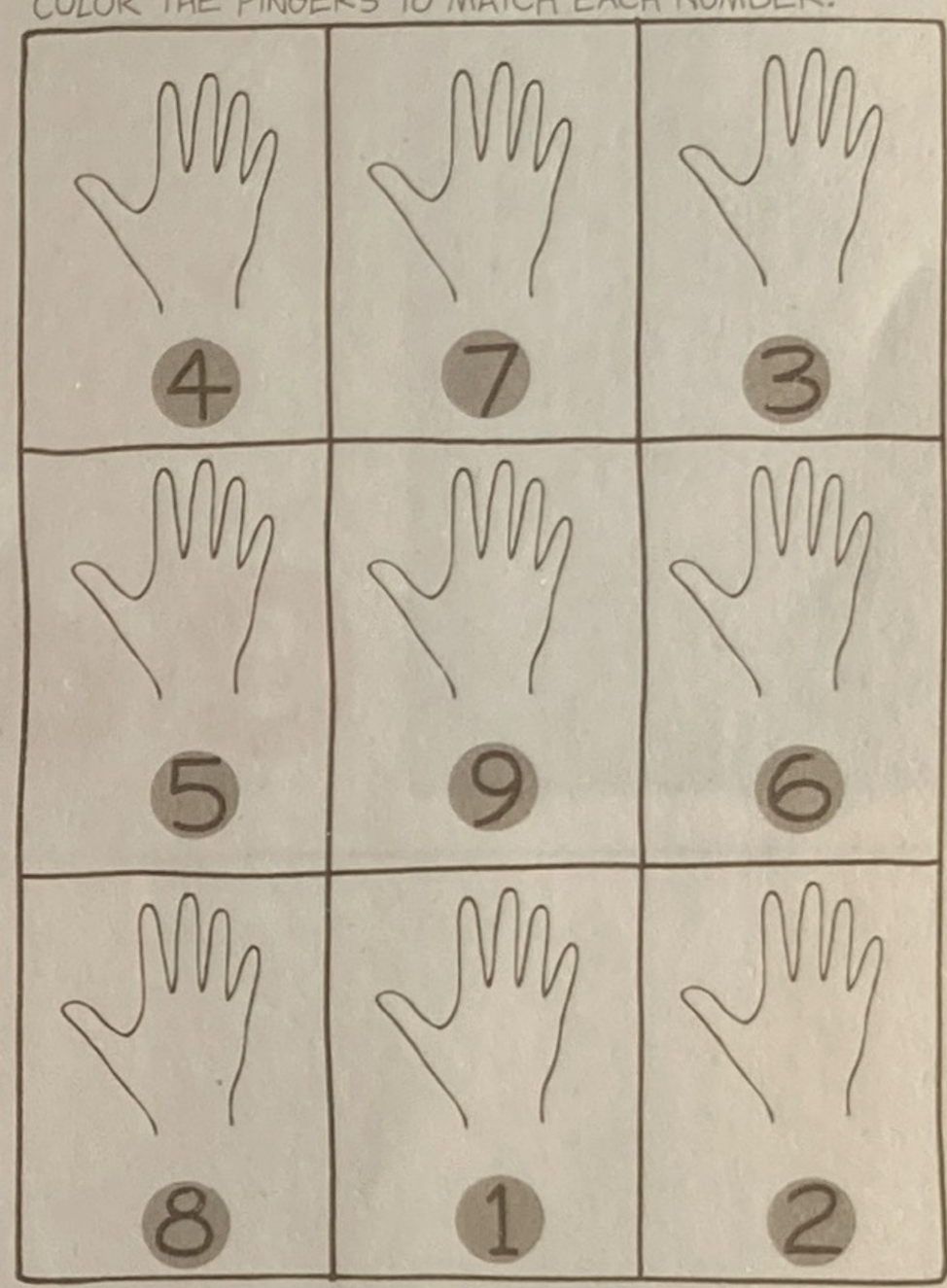
LOOK AT THE FIRST PICTURE. WHAT NUMBER IS WRITTEN UNDER THE HAND? Four. COLOR IN THE CORRECT FINGERS TO SHOW FOUR ON THE FINGERPRESS HAND. Go around the room and check. Let the class work the rest alone.

DRAW A LINE FROM THE HAND TO THE NUMBER THAT MATCHES.



37

COLOR THE FINGERS TO MATCH EACH NUMBER.



38

unit

7

Adding to 9

Basal Reference

1. Counting concrete objects to 9.
2. Rote counting to 9.
3. Numeration to 9.
4. Addition with sums to 9.

Fingermath Prerequisites

Units 1, 2, 3, 4, 5, 6

*Objective 33 (TE page 79)**

The pupil can add 2 one-digit numbers with sums to 6 with and without Fingermath.

Class Activity 33A
Book Activity 33 (page 39)**
Game Activity 33
Class Activity 33B

Objective 34 (TE page 83)

The pupil can add 2 one-digit numbers with sums to 7 with and without Fingermath.

Class Activity 34A
Book Activity 34 (page 40)
Game Activity 34
Class Activity 34B

Objective 35 (TE page 85)

The pupil can add 2 one-digit numbers with sums to 8 with and without Fingermath.

Class Activity 35A
Book Activity 35 (page 41)
Game Activity 35
Class Activity 35B

Objective 36 (TE page 88)

The pupil can add 2 one-digit numbers with sums to 9 with and without Fingermath.

Class Activity 36A
Book Activity 36A (page 42)
Game Activity 36
Class Activity 36B
Book Activity 36B (page 43)

Objective 37 (TE page 90)

The pupil can fingerpress sums to 9 and verbalize appropriately.

Class Activity 37
Book Activity 37A (page 44)
Book Activity 37B (page 45)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 33

The pupil can add 2 one-digit numbers with sums to 6 with and without Fingermath.

Synopsis

Practice is provided in gradations. Succeeding activities cover sums to 7, 8, and 9. One difficulty children may encounter in using Fingermath involves correct verbalization. It is important that children verbalize the second and all subsequent addends starting with one. Thus, 2 + 3 would be verbalized as two, *one,* two, three and *not* two, *three,* four, five. For this reason, pupils must have daily practice verbalizing. Early attention to this procedure will prevent difficulty later on. This problem tends to first appear in sums adding to 10 or more, although it may occur at any stage.

Some pupils make such a strong association between a fingerpress position such as 7, and the verbalization seven, that in the sum 6 + 1 it is difficult for them to say "one" when they press the second addend. Thus the verbal practice is essential and will need to be stressed throughout this unit and succeeding units.

Class Activity 33A

1 + 5 = __	2 + 3 = __	2 + 3	1 + 4	3 + 3
3 + 1 = __	1 + 2 = __	1 + 3	4 + 2	2 + 4
4 + 2 = __	1 + 4 = __	1 + 4	1 + 1	3 + 1
2 + 2 = __	1 + 1 = __	3 + 2	4 + 1	1 + 5
3 + 2 = __	2 + 4 = __	2 + 2	5 + 1	1 + 2
4 + 1 = __	1 + 3 = __			
2 + 1 = __	1 + 5 = __			

Demonstrate for the class the procedure you want them to follow. Point to 1 + 5. *Do not press at this step.* ONE, ONE, TWO, THREE, FOUR, FIVE. Point out to the class that the second addend was verbalized beginning with the number one.

NOW I WILL SAY AND PRESS THE NUMBER AT THE SAME TIME AND YOU DO THE SAME THING AT YOUR SEATS. ONE, ONE, TWO, THREE, FOUR, FIVE. READ YOUR FINGERS. Six. Write the answer in the space. CLEAR YOUR FINGERS. Have volunteers come to the board and follow the same two-step procedure for each of the sums at the board. The class is to press the numbers with them.

Book Activity 33
(page 39)

Board:

1 + 5 = __	2 + 4 = __	3 + 3 = __
4 + 2 = __	5 + 1 = __	6 + 0 = __

Have individual pupils come to the board, press one of these sums, and write in the correct answer. Then turn to page 39. Allow the class to work four examples at a time. Check each set of four with the class.

Game Activity 33 PRESS GAME

Materials: A set of large flash cards for the following new addition facts:

6 + 0	3 + 3	1 + 5
5 + 1	2 + 4	0 + 6
4 + 2		

Flash cards for all previous facts.

WE ARE GOING TO PLAY THE PRESS GAME AGAIN. AS SOON AS YOU SEE THE CARD WITH THE ADDITION EXAMPLE, PRESS THE FIRST NUMBER DIRECT. THEN PRESS THE NEXT NUMBER ONE BY ONE. I'LL CALL ON SOMEONE FOR EACH ANSWER.

Repeat all the cards orally, calling each set of numbers, then choosing a different child for each answer.

Class Activity 33B Internalization Drill:

This is the first in an organized series of exercises that provide the teacher with an indication of how well the children are learning addition sums achieved through Fingermath and other classwork.

Materials: Flash cards of sums to 6, as used in previous activities.

EVERYBODY SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE SUM, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR THE ANSWER.

Display each card in random order and record results.

ADD THE NUMBERS AND WRITE THE ANSWER.

1 + 5 =	1 +4	4 +2
3 + 1 =		
2 + 3 =	2 +1	2 +3
1 + 2 =		
3 + 3 =	3 +1	1 +5
2 + 4 =		
5 + 1 =	4 +1	3 +3
1 + 3 =		
4 + 1 =	2 +3	1 +2
2 + 2 =		
1 + 1 =	2 +2	3 +1
3 + 2 =		

39

Fingermath is still new. We, at McGraw-Hill, look to the experience of classroom teachers for assistance in improving the Fingermath educational program. We will be most grateful if you could take ten minutes to fill out this questionnaire and mail it to us. Thank you for your participation in this survey.

RESEARCH RESPONSE

Date: _____

1. _____
   Name (please print)
2. _____
   School
   _____
   Address
   _____
   City State Zip
3. K☐ 1☐ 2☐ 3☐ 4☐
   Grade(s) I am teaching ☐ _____
4. _____
   Basal Math Program Used
5. I am ☐ am not ☐ coordinating the FINGERMATH TE Curriculum with the basal program.
6. As of this date I have taught Fingermath through
   Objective # _____
7. My average Fingermath lesson lasts _____ minutes.
8. I teach Fingermath to a class _____ days each week.
9. I learned Fingermath skills from: (Check as many as appropriate)
   a. Another teacher ☐
   b. The Complete Book of Fingermath (CBF) ☐
   c. A workshop ☐ . . . duration _____ Hours.

10. The Teacher's Edition is ☐ is not ☐ easy to follow.
11. The Teacher's Edition is ☐ is not ☐ used regularly as a curriculum guide.
12. I have ☐ have not ☐ coordinated pages from CBF as a reference for Fingermath teaching.

13. The exercises in the pupil's book are ☐ are not ☐ useful.
If not, why? _____

_____

14. I assign additional Fingermath work, such as: _____

_____

15. On the whole, Fingermath is ☐ is not ☐ reinforcing the computational skills of the pupils.

16. Number of pupils _____. Boys _____. Girls _____.

17. Of this number, _____ are making excellent progress with Fingermath
_____ are just managing to keep up
_____ are not doing well

18. Of this number, _____ are characterized as learning disabled.

19. These LD pupils are ☐ are not ☐ learning Fingermath.

20. These LD pupils have ☐ have not ☐ been helped by Fingermath.
Please Explain: _____

_____

_____

21. The Teacher's Edition is ☐ is not ☐ well structured.
If not, please suggest how to improve: _____

_____

_____

22. The Pupil's Book does ☐ does not ☐ contain enough material.
If not, which portions should be increased or improved? _____

23. _____ other Fingermath classes are taught in my school in grades _____.

24. I would recommend the following modifications, additions or deletions in the Primary Fingermath program: _____

_____

_____

25. I would ☐ would not ☐ be interested in receiving ongoing data regarding general teacher reaction to the Fingermath program.

Send response to: Edwin M. Lieberthal
Fingermath, Dept. TP
McGraw-Hill Book Company
1221 Avenue of the Americas
New York, NY 10020

OBJECTIVE 34

The pupil can add 2 one-digit numbers with sums to 7 with and without Fingermath.

Class Activity 34A

Board:

1 + 5 = __	2 + 5 = __	2 + 5	1 + 4	3 + 3
3 + 4 = __	1 + 2 = __	4 + 3	4 + 2	2 + 4
4 + 2 = __	1 + 4 = __	1 + 4	6 + 1	5 + 1
2 + 2 = __	1 + 6 = __	3 + 2	4 + 1	5 + 2
3 + 2 = __	2 + 4 = __	2 + 5	5 + 1	1 + 2
4 + 1 = __	1 + 3 = __			
5 + 2 = __	5 + 1 = __			

Demonstrate the two-step counting procedure exactly as it was presented previously in Class Activity 33A. This emphasized the need to begin the count for a second addend with one.

Pupils come to the board one at a time. Give them each a sum to press and verbalize. The pupil presses it at the board while verbalizing, writes the answer in the space provided, and then faces the class and gives them the same sum to press and verbalize.

Book Activity 34
(page 40)

Board:

1 + 6 = __	3 + 4 = __	5 + 2 = __
2 + 5 = __	4 + 3 = __	7 + 0 = __

Have individual pupils come to the board, press one of these sums, and write in the correct answer. Then turn to page 40. Allow the class to work four examples at a time. Check each set of four with the class.

Game Activity 34

PRESS GAME

Materials: A set of large flash cards for the following new addition facts:

7 + 0	4 + 3	1 + 6
6 + 1	3 + 4	0 + 7
5 + 2	2 + 5	

Flash cards for all previous addition facts.

WE ARE GOING TO PLAY THE PRESS GAME AGAIN. AS SOON AS YOU SEE THE CARD WITH THE ADDITION EXAMPLE, PRESS THE FIRST NUMBER DIRECT. THEN PRESS THE NEXT NUMBER ONE BY ONE. I'LL CALL ON SOMEONE FOR EACH ANSWER.

Repeat all the cards orally, calling each set of numbers, then choosing a different child for each answer.

Class Activity 34B

Internalization Drill:

This is another in the organized series of exercises that provide the teacher with an indication of how well the children are learning addition sums achieved through Fingermath and other classwork.

Materials: Flash cards of sums to 7, as used in previous activities.

EVERYBODY SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE SUM, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR THE ANSWER.

Display each card in random order and record results.

ADD THE NUMBERS AND WRITE THE ANSWER.

6 + 1 =	6 +1	3 +4
2 + 4 =		
2 + 5 =	3 +4	1 +5
5 + 1 =		
4 + 1 =	6 +1	5 +2
5 + 2 =		
2 + 3 =	1 +6	2 +5
4 + 3 =		
4 + 2 =	0 +5	0 +6
3 + 3 =		
3 + 2 =	4 +3	1 +6
1 + 4 =		

40

OBJECTIVE 35

The pupil can add 2 one-digit numbers with sums to 8 with and without Fingermath.

Class Activity 35A

Board:

1 + 5 = __	2 + 3	6 + 1
3 + 1 = __		
4 + 2 = __	4 + 3	5 + 2
4 + 3 = __		
3 + 2 = __	1 + 4	3 + 3
5 + 2 = __		
2 + 1 = __	3 + 2	2 + 4
2 + 3 = __		
1 + 6 = __	2 + 2	3 + 1
1 + 4 = __		
3 + 5 = __	4 + 4	1 + 5
2 + 4 = __		
1 + 3 = __	4 + 2	6 + 2
4 + 4 = __	7 + 1	

Demonstrate the two-step counting procedure exactly as it was presented previously in Class Activity 33A. This emphasized the need to begin the count for a second addend with one.

Pupils come to the board one at a time. Give each of them a sum to press and verbalize. The pupil presses it at the board while verbalizing, writes the answer in the space provided, and then faces the class and gives them the same sum to press.

Book Activity 35
(page 41)

Board:

1 + 7 = __	3 + 5 = __	5 + 3 = __
2 + 6 = __	4 + 4 = __	6 + 2 = __

Have individual pupils come to the board, press one of these sums, and write in the correct answer. Then turn to page 41. Allow the class to work four examples at a time. Check each set of four with the class.

Game Activity 35 PRESS GAME

Materials: A set of large flash cards for the following new addition facts:

8 + 0	5 + 3	2 + 6
7 + 1	4 + 4	1 + 7
6 + 2	3 + 5	0 + 8

Flash cards for all previous addition facts.

WE ARE GOING TO PLAY THE PRESS GAME AGAIN. AS SOON AS YOU SEE THE CARD WITH THE ADDITION EXAMPLE, PRESS THE FIRST NUMBER DIRECT. THEN PRESS THE NEXT NUMBER ONE BY ONE. I'LL CALL ON SOMEONE FOR EACH ANSWER.

Repeat all the cards orally, calling each set of numbers, then choosing a different child for each answer.

Class Activity 35B Internalization Drill:

This is another in the organized series of exercises that provide the teacher with an indication of how well the children are learning addition sums achieved through Fingermath and other classwork.

Materials: Flash cards of sums to 8, as used in previous activities.

EVERYBODY SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE SUM, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR THE ANSWER.

Display each card in random order and record results.

ADD THE NUMBERS AND WRITE THE ANSWER.

5+2=	3 +5	3 +4
4+4=		
1+6=	2 +4	1 +7
3+5=		
6+2=	2 +5	4 +4
2+5=		
5+3=	5 +3	3 +3
7+1=		
2+6=	4 +2	3 +2
1+7=		
8+0=	5 +2	6 +2
6+1=		

41

OBJECTIVE 36

The pupil can add 2 one-digit numbers with sums to 9 with and without Fingermath.

Class Activity 36A Board:

1 + 5 = __	8	4
5 + 3 = __	+ 1	+ 1
4 + 2 = __	4	5
4 + 5 = __	+ 3	+ 1
3 + 2 = __	1	3
4 + 1 = __	+ 4	+ 3
6 + 1 = __	3	2
2 + 3 = __	+ 2	+ 4
2 + 5 = __	2	3
4 + 4 = __	+ 2	+ 6
8 + 1 = __	5	2
2 + 7 = __	+ 4	+ 5
1 + 3 = __	4	6
1 + 5 = __	+ 2	+ 2
	7	
	+ 1	

Demonstrate the two-step counting procedure exactly as it was presented previously in Class Activity 33A. This emphasized the need to begin the count for a second addend with one.

Pupils come to the board one at a time. Give each of them a sum to press and verbalize. The student presses it at the board while verbalizing, writes the answer in the space provided, and then faces the class and gives them the same sum to press.

Book Activity 36A (page 42) Board:

0 + 9	4 + 5	7 + 2
1 + 8	5 + 4	8 + 1
2 + 7	6 + 3	9 + 0
3 + 6		

Have individual pupils come to the board, press one of these sums, and write in the correct answer. Then turn to page 42. Allow the class to work four examples at a time. Check each set of four with the class.

PRESS GAME

Game Activity 36

Materials: A set of large flash cards for all sums equalling 9. (Refer to Book Activity 36A.)

Flash cards for all previous addition facts.

WE ARE GOING TO PLAY THE PRESS GAME AGAIN. AS SOON AS YOU SEE THE CARD WITH THE ADDITION EXAMPLE, PRESS THE FIRST NUMBER DIRECT. THEN PRESS THE NEXT NUMBER ONE BY ONE. I'LL CALL ON SOMEONE FOR EACH ANSWER.

Repeat all the cards orally, calling each set of numbers.

Internalization Drill:

Class Activity 36B

This is another in the organized series of exercises that provide the teacher with an indication of how well the children are learning sums achieved through Fingermath and other classwork.

Materials: Flash cards of sums to 9, as used in previous activities.

EVERYBODY SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE SUM, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR THE ANSWER.

Display each card in random order and record results.

Review sums from 6 to 9. Have class turn to page 43 and complete all examples.

Book Activity 36B (page 43)

ADD THE NUMBERS AND WRITE THE ANSWER.

6+1=	2 +7	6 +3
2+6=		
0+7=	4 +4	1 +8
5+4=		
7+1=	3 +5	5 +4
5+3=		
1+7=	4 +5	6 +2
2+6=		
3+6=	7 +2	0 +8
4+5=		
7+2=	2 +7	6 +3
1+5=		

42

ADD THE NUMBERS AND WRITE THE ANSWER.

1+5=	2 +6	3 +3
2+3=		
3+5=	3 +2	5 +2
4+2=		
5+4=	2 +5	3 +6
1+0=		
2+1=	4 +5	2 +2
6+2=		
5+2=	7 +1	1 +6
4+3=		
6+3=	4 +5	3 +4
2+4=		

43

OBJECTIVE 37

The pupil can fingerpress sums to 9 and verbalize appropriately.

Class Activity 37 Board:

4 + 3	6 + 3	5 + 3	2 + 3	1 + 7
1 + 6	2 + 5	7 + 2	8 + 1	2 + 2
4 + 4	3 + 3	2 + 4	3 + 6	4 + 1
3 + 2	5 + 1	1 + 5	1 + 4	6 + 1
7 + 1	2 + 7	4 + 2	3 + 5	4 + 5
5 + 4	3 + 4	1 + 1	2 + 6	1 + 8
2 + 1	1 + 3	6 + 2	5 + 2	3 + 1

Demonstrate for the class the procedure you want them to follow.

Point to 4 + 3. *Do not press at this step.* FOUR PLUS THREE. Then say, NOW I WILL SAY AND PRESS THE NUMBERS AT THE SAME TIME, AND YOU DO THE SAME THING AT YOUR SEATS. FOUR ONE, TWO, THREE. READ YOUR FINGERS. Seven. CLEAR YOUR FINGERS. Have volunteers come to the board and follow the same procedure for each of the sums at the board. Be certain the second addend is pressed and verbalized one by one.

Book Activity 37A (page 44) Board:

4 + 3 = _

$$\begin{array}{r} 5 \\ +\ 3 \\ \hline \end{array}$$

Following the same process as in Class Activity 37, have the pupils first verbalize, then verbalize and press each sum. Again call on individuals to lead the class, this time from their seats. Begin by demonstrating the horizontal and then the vertical sums at the board.

Book Activity 37B (page 45) Board:

3 + 1 + 1 = _

$$\begin{array}{r} 3 \\ 2 \\ +\ 4 \\ \hline \end{array}$$

Follow the same two-step procedure for these sums with three addends as in Book Activity 37A.

Be certain each new addend begins with a count of one.

ADD THE NUMBERS AND WRITE THE ANSWER.

3+3=	6 +3	5 +2
5+4=		
6+1=	2 +3	4 +2
1+4=		
2+5=	3 +4	1 +6
4+4=		
7+1=	5 +3	6 +2
3+6=		
4+5=	2 +4	3 +5
7+2=		
3+4=	8 +1	4 +1
2+6=		

7+1+1=	6 2 +1	1 3 +4
3+2+3=		
5+1+2=	5 2 +5	5 3 +1
4+3+2=		
2+2+4=	4 1 +2	3 3 +2
3+1+4=		
5+2+2=	2 3 +3	1 1 +5
1+2+4=		
4+3+1=	2 4 +3	4 2 +3
1+1+7=		
4+2+1=	2 4 +1	1 4 +3
1+4+1=		

unit

8

Subtracting from Minuends to 5

Basal Reference

1. Activities that give children practice counting objects and taking away counters.
2. Activities that introduce the symbols and vocabulary for subtraction.
3. Some basal programs use missing addends as part of their introduction to subtraction. If your text does not include missing addends, skip Objective 38.
4. A math balance or balance scale is a useful aid when addressing the subject of missing addends.

Fingermath Prerequisites

Units 1 through 5.

Note: Throughout Unit 8, precede each day's lesson with a warm-up of pressing and clearing by 1s, to and from 5.

*Objective 38 (TE page 95)**

The pupil can supply a missing addend in a number equation with sums to 5.

Book Activity 38 (page 46)**

Objective 39 (TE page 97)

The pupil can clear fingers one at a time, going from the pinky to the index finger.

Book Activity 39A (page 47)
Book Activity 39B (page 48)

Objective 40 (TE page 99)

The pupil can subtract from minuends to 4, with Fingermath.

Book Activity 40 (page 49)

Objective 41 (TE page 101)

The pupil can make a 5 to 4 exchange by comparing fingerpress activity to counters.

Class Activity 41

Objective 42 (TE page 102)

The pupil can identify two distinct ways to subtract 1 in Fingermath.

Book Activity 42 (page 50)

Objective 43 (TE page 104)

The pupil can subtract from minuends of 5, with Fingermath.

Book Activity 43A (page 51)
Book Activity 43B (page 52)

Objective 44 (TE page 106)

The pupil can clear the numbers 1 through 5.

Class Activity 44

Objective 45 (TE page 107)

The pupil shows mastery of basic subtraction facts with minuends to 5.

Class Activity 45

Objective 46 (TE page 108)

The pupil can subtract 2 one-digit numbers with minuends to 5, and can supply the missing addend in number equations.

Book Activity 46 (page 53)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 38

The pupil can supply a missing addend in a number equation with sums to 5. (Review *The Complete Book of Fingermath* pages 169–173.)

Synopsis

This objective is not a prerequisite for Fingermath subtraction, which would logically follow Fingermath addition. Indeed, Fingermath addition and subtraction are good examples of inverse operations because they work in opposite directions on a concrete psychomotor level.

A treatment of missing addends is included here because (1) it is very easy to do by Fingermath; (2) it appears as a forerunner of, and by implication a prerequisite to, subtraction in some standard textbooks; and (3) it is frequently thought to be difficult to teach and to learn by conventional techniques.

If your basal text does not cover missing addends, skip this objective.

The 4 to 5 exchange must be learned before this objective is used. (Review *The Complete Book of Fingermath,* pages 28–31.)

Warm-up

Direct press numbers to 5; add sums to 5.

Book Activity 38
(page 46)

Board:

$$2 + 2 = \square$$

Point to the first 2. THIS TELLS ME TO PRESS TWO FINGERS. NOW YOU PRESS TWO FINGERS. Two. HOLD THAT PRESS NOW.

Point to the second 2. THIS TELLS ME TO PRESS TWO MORE FINGERS. NOW YOU PRESS TWO MORE FINGERS, ONE BY ONE. One, two.

Point to the box. THIS BOX ASKS ME HOW MANY FINGERS I HAVE PRESSED. HOW MANY FINGERS DO YOU HAVE PRESSED? Four. GOOD. Write 4 in this box.

BUT NOW LOOK AT THIS ONE. IT IS DIFFERENT.

Board:

$$1 + \square = 3$$

Point to the 1. THIS TELLS ME TO PRESS ONE FINGER. NOW YOU PRESS ONE FINGER. One. HOLD THAT PRESS NOW.

Point to the box. THIS BOX ASKS US HOW MANY MORE FINGERS MUST WE PRESS (point to the 3) SO THAT WE END UP WITH THREE FINGERS PRESSED?

NOW I'LL PRESS MORE FINGERS TO ANSWER THAT QUESTION: *HOW MANY MORE* FINGERS MUST I PRESS SO THAT I END UP WITH THREE? WATCH! ONE, TWO. THERE IT IS! THREE. I NEEDED TWO MORE TO END UP WITH THREE. SO, WHAT DO I WRITE IN THE BOX? Two. Write 2 in the box.

LET'S DO THAT ONE AGAIN. Repeat and explain.

Board:

$$2 + \square = 3$$

Go through the same pattern with the class. Then have the class open their books to page 46. For each example, ask a different pupil to come to the board and lead the class, using the same dialogue. Be sure the children follow the oral pattern correctly, being certain to stress the need to begin a new count with one.

FIND THE MISSING NUMBER AND WRITE IT IN THE BOX.

1 + □ = 3	2 + □ = 4
3 + □ = 4	0 + □ = 0
0 + □ = 1	2 + □ = 5
2 + □ = 2	0 + □ = 2
0 + □ = 4	5 + □ = 5
1 + □ = 5	1 + □ = 2
4 + □ = 4	2 + □ = 3
1 + □ = 1	1 + □ = 4
0 + □ = 3	4 + □ = 5
3 + □ = 5	0 + □ = 5

46

OBJECTIVE 39

The pupil can clear fingers one at a time, going from the pinky to the index finger.

Synopsis

This objective reviews the clearing process learned in Unit 2.

Subtraction in Fingermath follows naturally from addition. The rule that the last finger pressed is first finger cleared governs all clearing maneuvers. (See *The Complete Book of Fingermath,* pages 78–87.)

Vocabulary

Clear one, clear two, clear three, clear four

Warm-up

Pressing by 1s to 4; clearing by 1s from 4.

Book Activity 39A (page 47)

Teach the pupils the correct way to verbalize as they count. Counting backwards from four does not mean saying the words backwards (four, three, two, one). Instead, each step of the subtraction process always is counted forwards from one. For example, given the subtraction 4 – 2, the procedure is as follows:

PRESS FOUR. One, two, three, four. SUBTRACT TWO. One, two. READ YOUR FINGERS. Two. CLEAR YOUR FINGERS.

At this stage, do not give subtraction examples to do, but rather press fingers one by one up to 4 and clear fingers one by one down to 0. The following is an opening script for the lesson:

PRESS FOUR. One, two, three, four.

WHICH FINGER WOULD YOU CLEAR IF I TOLD YOU TO CLEAR 1?

The discussion should make clear that the last finger pressed is the first finger cleared (last in—first out).

Clearing one means first lifting the finger that was pressed last.

Clearing two means lifting the last two fingers pressed in reverse order, from right to left.

Clearing three means lifting the last three fingers pressed in reverse order, from right to left.

Clearing four means lifting first the pinky, then the ring finger, then the middle finger, and then the index finger: the reverse of the order of pressing.

Demonstrate at the board with your back to the class.

PRESS FOUR. One, two, three, four. CLEAR ONE. One. WHICH FINGER DID YOU CLEAR? The pinky. CLEAR TWO MORE. One, two. WHICH FINGERS DID YOU CLEAR? The ring finger and the middle finger.

READ YOUR FINGERS. One. CLEAR ONE MORE. One. WHICH FINGER DID YOU CLEAR? The index finger. READ YOUR FINGERS. Zero.

Do the following with the class, in each case asking which fingers were cleared and continuing with the routine dialogue, as in the first example below:

PRESS FOUR. CLEAR THREE. WHICH FINGERS DID YOU CLEAR? READ YOUR FINGERS. CLEAR YOUR FINGERS.

PRESS THREE. CLEAR TWO. . . .
PRESS THREE. CLEAR ONE. . . .
PRESS FOUR. CLEAR TWO. . . .
PRESS TWO. CLEAR TWO. . . .
PRESS FOUR. CLEAR ZERO. . . .
PRESS TWO. CLEAR ONE. . . .
PRESS ONE. CLEAR ONE. . . .
PRESS THREE. CLEAR ZERO. . . .
PRESS FOUR. CLEAR ONE. . . .
PRESS TWO. CLEAR ZERO. . . .
PRESS THREE. CLEAR THREE. . . .

PRESS ONE. CLEAR ZERO. . . .

PRESS FOUR. CLEAR FOUR. . . .

PRESS ZERO. CLEAR ZERO. . . .

Have the class turn to page 47 and each take out one crayon.

LOOK AT THE FIRST BOX, THE BOX MARKED *ONE*. HOW MANY FINGERS ARE PRESSED? Three. IF I SAID "CLEAR ONE," WHICH FINGER WOULD YOU CLEAR? The ring finger. CROSS OUT THE RING FINGER WITH YOUR CRAYON.

Do the other boxes in the same manner, subtracting 1 from each and having the class cross off the finger to be cleared.

Book Activity 39B (page 48)

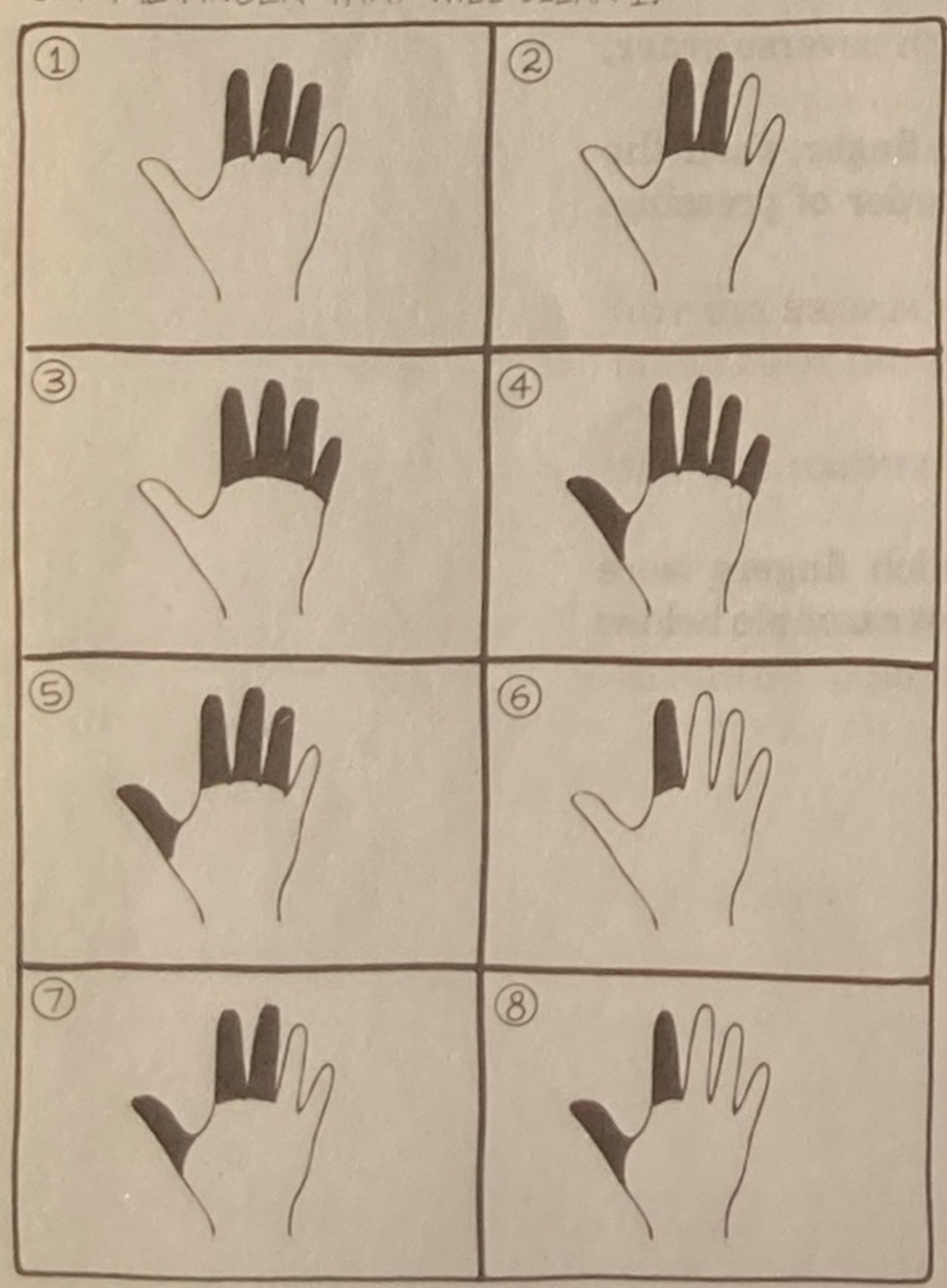
Board:

4 __	3 __
2 __	1 __

Ask volunteers to come by turns to the board, press the number indicated, read their fingers, and then ask them for the number that is one less. Have them clear one to check.

Then have the class turn to page 48 and complete with Fingermath.

PRESS THE AMOUNT SHOWN ON EACH HAND. CROSS OUT THE FINGER THAT WILL CLEAR 1.



47

PRESS THE NUMBER SHOWN. THEN CLEAR 1. WRITE DOWN THE NEW NUMBER THAT IS 1 LESS.

8	5	3
6	9	5
5	7	7
3	8	9
9	2	8
6	3	6
2	4	4
1	7	2
4	6	9
5	9	5

48

OBJECTIVE 40

The pupil can subtract from minuends to 4, with Fingermath.

Synopsis

This lesson
1. Links the minus sign (–) to finger activity.
2. Teaches the class to orally count the subtrahend separately from the minuend. The procedure is as follows: PRESS FOUR. One, two, three, four. SUBTRACT THREE. One, two, three. Do not allow the following verbalization to occur: PRESS FOUR. One, two, three, four. SUBTRACT THREE. Three, two, one.
3. Connects the words *clear* and *subtract.*

Vocabulary

Subtract, minus, take away

Book Activity 40
(page 49)

Materials: Felt board, four felt counters
Board:

3 – 1 = __	4 – 2 = __	4 – 3 = __

TODAY WE WILL FIND OUT THAT WE ARE SUBTRACTING WHEN WE CLEAR OUR FINGERS. SUBTRACTING IS A WAY OF TAKING SOMETHING AWAY, REMOVING SOMETHING, THROWING SOMETHING AWAY, PUTTING SOMETHING AWAY, OR CLEARING SOMETHING AWAY. Put four counters on the felt board.

HOW MANY COUNTERS ARE THERE ON THE BOARD? Four.

IF I TAKE ONE AWAY OR THROW IT AWAY, I HAVE SUBTRACTED ONE. Take one away. NOW HOW MANY DO WE HAVE ON THE FELT BOARD? Three. WHAT DOES SUBTRACT MEAN? To take away; remove; throw away; clear; put away.

WHEN WE WERE DOING ADDITION, WE LEARNED TO USE A PLUS SIGN. Put a plus sign on the felt board. NOW WE ARE DOING SUBTRACTION, SO WE WILL LEARN TO USE A *MINUS* SIGN. Put a minus sign on the felt board. EVERYONE SAY *MINUS.* Minus.

Put 4 – 3 on the felt board.

THIS SAYS "FOUR MINUS THREE," BUT YOU CAN ALSO READ IT AS "FOUR CLEAR THREE."

Put three counters up on the felt board. Remove two counters from the felt board and ask a pupil to state a subtraction sentence that describes the situation. Three minus two; three take away two. Go to the chalkboard that has 3 – 1 on it.

LOOK AT THIS. HOW WOULD YOU DO THIS USING FINGERMATH? Press three, clear one. DO IT. One, two, three. One. READ YOUR FINGERS. Two.

Do the other two examples on the chalkboard with the class. Then ask them to turn to page 49 in the book. Do these subtractions with the class, allowing a different pupil to count aloud each exercise.

SUBTRACT AND WRITE THE ANSWER.

2−1=	3−1=
3−1=	4−3=
4−1=	3−2=
4−2=	4−2=
3−2=	2−2=
4−3=	4−1=
2−0=	1−1=
1−0=	4−0=
4−4=	3−3=
2−2=	4−4=

49

OBJECTIVE 41

The pupil can make a 5 to 4 exchange by comparing fingerpress activity to counters.

Synopsis

The pupil will, over a period of time, gain a fuller understanding of the 5 to 4 exchange. At this stage a concrete analogy will motivate and clarify the lesson. (See CBF page 82.)

Warm-up

Pressing by 1s to 5; 4 to 5 exchange; Direct Pressing to 5.

Class Activity 41

Materials: Felt board and five felt counters, as well as five counters of any convenient material for each child, such as bottle caps, buttons, or the like.

HOW MANY COUNTERS DOES EACH OF YOU HAVE? Five. DIRECT PRESS FIVE. Five. TAKE ONE COUNTER AWAY. HOW MANY COUNTERS DO YOU HAVE NOW? Four. DIRECT PRESS FOUR. Four. CLEAR YOUR FINGERS. IF I PRESS FIVE AND I TAKE ONE AWAY, HOW MANY WILL I HAVE LEFT? Four. THEN HOW WILL I GET TO FOUR ON MY FINGERS?

Look for a child who can demonstrate the 5 to 4 exchange—the back flip. Ask a pupil who can do it to come to the felt board and demonstrate it.

Have each pupil practice the back flip motion several times, following your direction. Demonstrate with counters at the felt board as you speak and the class responds.

HOW MANY DID YOU START WITH? Five. HOW MANY DID YOU TAKE AWAY? One. HOW MANY DO YOU HAVE LEFT? Four.

Demonstrate with the counters at the felt board as the class makes the 5 to 4 exchange. Remind the class that (a) before the back flip, there were five counters on the board and they were pressing 5; (b) the back flip took away 1; and (c) they then were pressing 4 and the felt board also showed four counters.

Next, have the class press 5 and then count down to 0 one by one. Count down several times. Finally, count to five by ones, and count down from five by ones. Repeat several times.

Use the model below for each of the following examples:

PRESS THREE. One, two, three. CLEAR TWO. One, two. READ YOUR FINGERS. One. CLEAR YOUR FINGERS.

PRESS FOUR. CLEAR TWO. . . .
PRESS THREE. CLEAR ONE. . . .
PRESS FIVE. CLEAR FOUR. . . .
PRESS ONE. CLEAR ONE. . . .
PRESS TWO. CLEAR ONE. . . .
PRESS THREE. CLEAR TWO. . . .
PRESS FIVE. CLEAR THREE. . . .
PRESS FOUR. CLEAR THREE. . . .
PRESS TWO. CLEAR TWO. . . .
PRESS FIVE. CLEAR ONE. . . .
PRESS FOUR. CLEAR FOUR. . . .
PRESS FIVE. CLEAR TWO. . . .
PRESS THREE. CLEAR THREE. . . .
PRESS FIVE. CLEAR FIVE. . . .

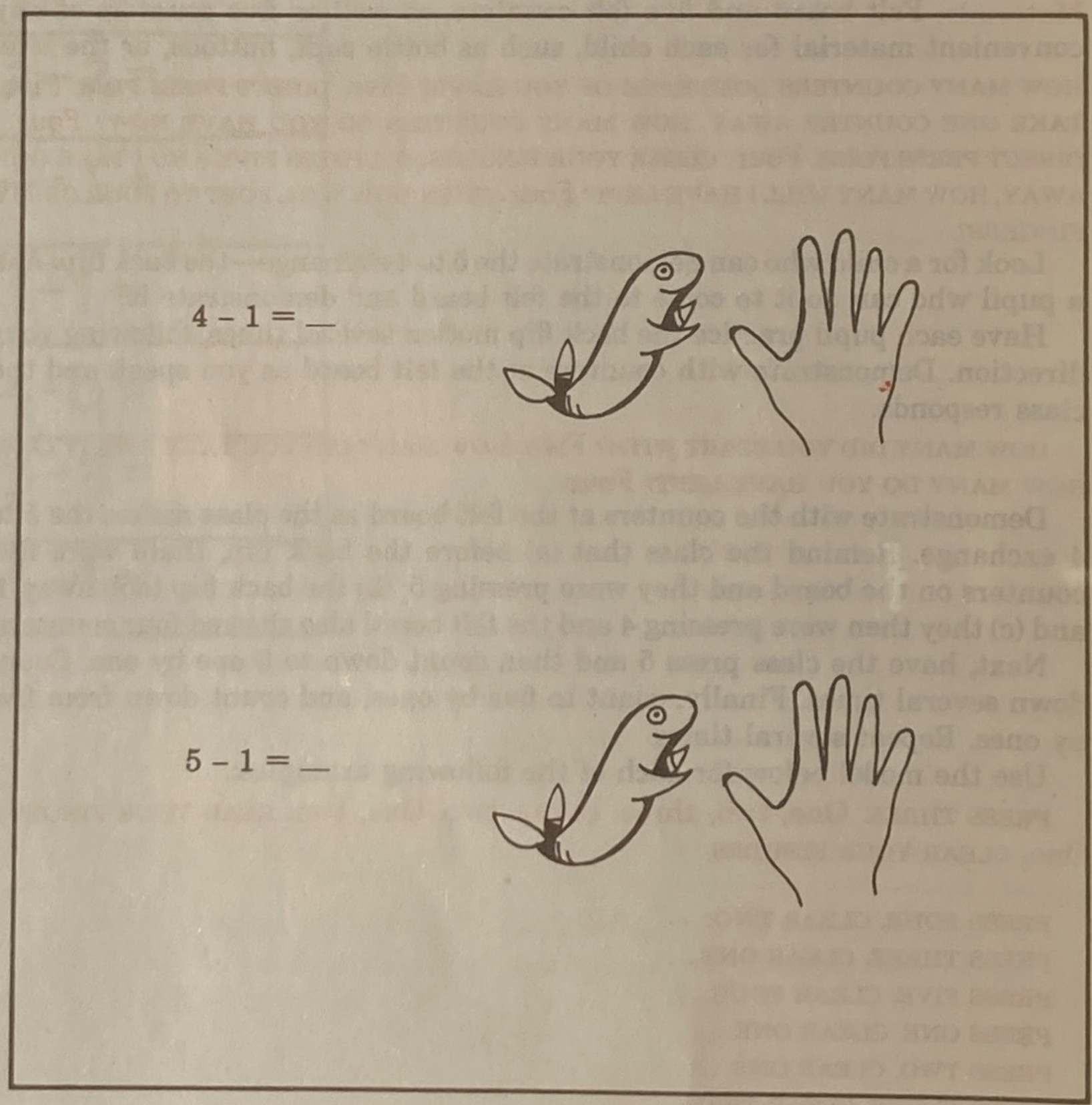
OBJECTIVE 42

The pupil can identify two distinct ways to subtract 1 in Fingermath.

Synopsis This lesson emphasizes the importance of recognizing the two established procedures for subtracting 1.

Warm-up Reverse counting from 5; 5 to 4 exchange.

Book Activity 42 (page 50) Board:



Have a pupil come to the board and do 4 – 1 = __ by pressing 4 and then clearing 1.

Have a second pupil come to the board and do 5 – 1 = __ by pressing 5 and then clearing 1, making the 5 to 4 exchange.

HOW DID (name the pupil) SUBTRACT ONE IN THE FIRST EXAMPLE? She or he cleared the pinky, or similar words.

Shade in the pinky on the hand picture.

HOW DID (name the pupil) SUBTRACT ONE IN THE SECOND EXAMPLE? She or he did a back flip, or equivalent words.

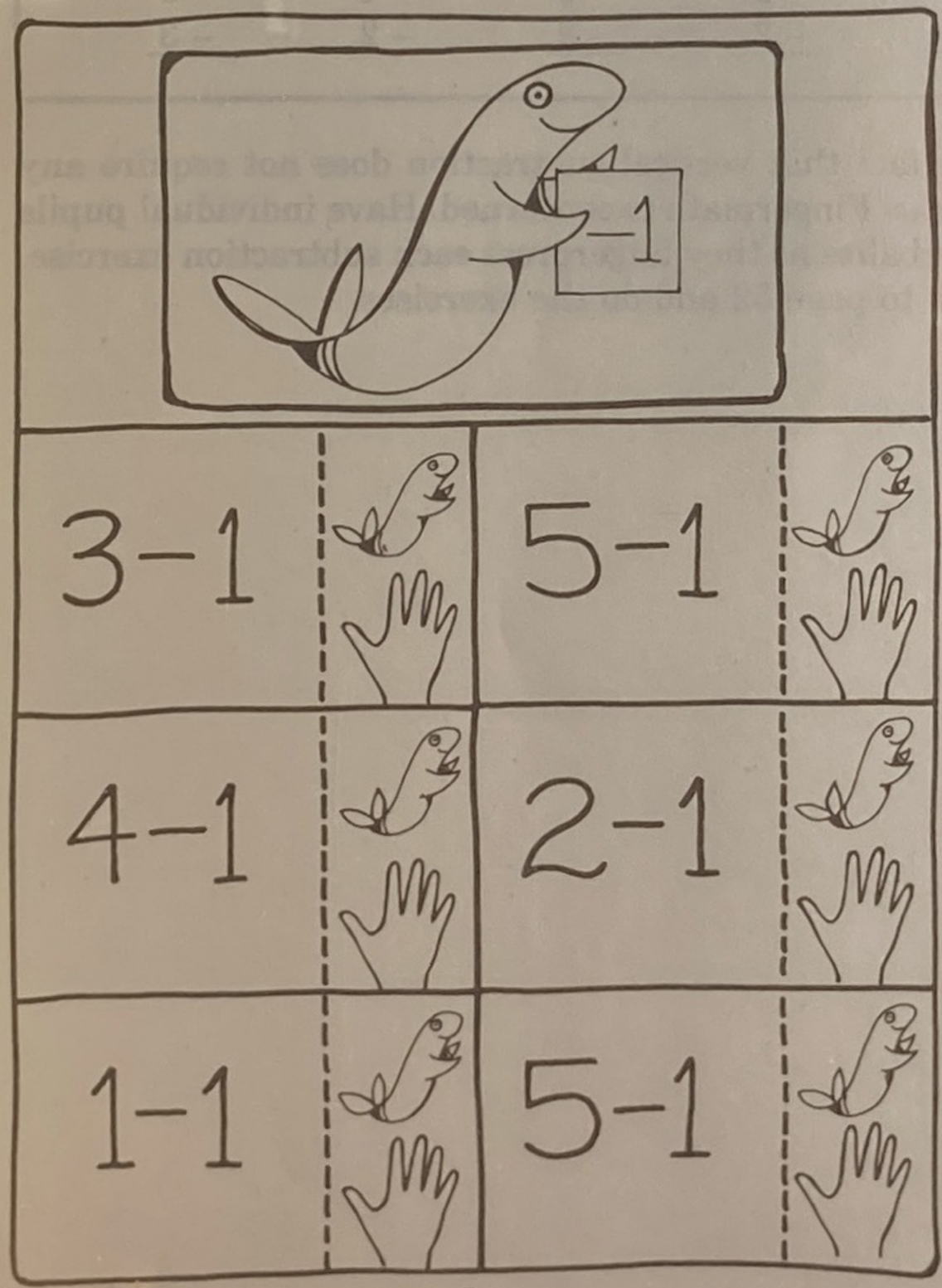
Shade in the picture of the flipper.

THAT MEANS WE CAN SUBTRACT ONE IN TWO DIFFERENT WAYS: WE CAN CLEAR A FINGER, (point to pinky) OR WE CAN USE THE LITTLE BACK FLIPPER. Demonstrate.

TURN TO PAGE 50 IN YOUR BOOK.

Work each of the differences with the class, letting them color in the correct finger or the flipper.

SUBTRACT THE NUMBERS. CIRCLE THE FLIPPER OR THE HAND.



50

OBJECTIVE 43

The pupil can subtract from minuends of 5, with Fingermath.

Warm-up Pressing to 5 and clearing from 5, one by one.

Book Activity 43A (page 51) Board:

5 – 1 = __	5 – 2 = __	5 – 3 = __
5 – 4 = __	5 – 5 = __	

I WOULD LIKE A VOLUNTEER TO COME TO THE FRONT AND LEAD THE WHOLE CLASS IN DOING THE FIRST EXAMPLE ON THE BOARD.

Make sure that the oral dialogue follows the standard pattern, with the volunteer speaking in your place, something like this: PRESS FIVE. One, two, three, four, five. CLEAR (OR SUBTRACT) ONE. One. READ YOUR FINGERS. Four.

The pupil may choose to direct press 5 instead of pressing 5 by ones, but the child must subtract only one by one at this stage. Have different pupils come to the board and verbalize as they demonstrate.

Next, have class turn to page 51. Again, different pupils are to lead the class in doing subtraction examples as everyone verbalizes.

Book Activity 43B (page 52) Board:

5	4	3	5	4	3
– 2	– 3	– 2	– 3	– 2	– 3

Mention to the class the fact that vertical subtraction does not require any different procedure as far as Fingermath is concerned. Have individual pupils come to the board and verbalize as they fingerpress each subtraction exercise. Then have the class turn to page 52 and do the exercises.

SUBTRACT AND WRITE THE ANSWER.

4-4=	4-0=
5-0=	3-2=
3-1=	4-3=
5-4=	3-0=
2-0=	5-5=
4-2=	1-0=
5-1=	2-2=
3-3=	5-3=
5-2=	4-1=
1-1 =	2-1=

51

SUBTRACT AND WRITE THE ANSWER.

4 -0	3 -3	5 -2	4 -4	2 -0
5 -3	2 -2	4 -3	5 -1	3 -0
3 -1	5 -0	4 -4	1 -1	5 -4
1 -0	4 -2	5 -5	3 -2	2 -1

52

OBJECTIVE 44

The pupil can clear the numbers 1 through 5.

Warm-up Clearing from 5, one by one.

Class Activity 44 Before starting this activity, demonstrate the way to clear 3 from 4. (4 – 3). Direct press 4; clear 3 by ones.

I AM GOING TO GIVE YOU SOME NUMBERS TO PRESS AND CLEAR. TRY TO DIRECT PRESS THE FIRST NUMBER AND CLEAR THE SECOND NUMBER ONE BY ONE. HERE WE GO.

PRESS 4. CLEAR 2. READ YOUR FINGERS. CLEAR YOUR FINGERS.
PRESS 3. CLEAR 1.
PRESS 4. CLEAR 3.
PRESS 2. CLEAR 2.
PRESS 3. CLEAR 2.
PRESS 4. CLEAR 4.
PRESS 5. CLEAR 5.
PRESS 3. CLEAR 3.
PRESS 2. CLEAR 1.
PRESS 5. CLEAR 1.
PRESS 5. CLEAR 3.
PRESS 3. CLEAR 0.
PRESS 5. CLEAR 2.
PRESS 2. CLEAR 0.
PRESS 5. CLEAR 4.

OBJECTIVE 45

The pupil shows mastery of basic subtraction facts with minuends to 5.

Synopsis

As with addition, it is important for youngsters to remember the basic subtraction facts rather than constantly rely on their fingers.

Warm-up

Direct clearing of numbers less than 5.

Class Activity 45

Materials: A set of large flash cards for the following subtraction facts:

4 – 4	3 – 3	2 – 2
4 – 3	3 – 2	2 – 1
4 – 2	3 – 1	1 – 1

I AM GOING TO HOLD UP SOME SUBTRACTION CARDS. AS SOON AS YOU SEE THE CARD, DIRECT PRESS THE FIRST NUMBER. THEN CLEAR THE SECOND NUMBER ONE BY ONE. AS SOON AS YOU'VE FINISHED, RAISE YOUR LEFT HAND. Go over the entire set of flash cards.

OBJECTIVE 46

The pupil can subtract 2 one-digit numbers with minuends to 5, and can supply the missing addend in number equations.

Book Activity 46 (page 53) Have the class open their books to page 53. When complete, collect these pages for evaluation of their progress.

WRITE THE ANSWERS.

4-4=		5-3=		
5-2=		4-0=		
3-2=		2-2=		
4-1=		3-0=		
5-0=		1-1 =		
3+□=5		2+□=4		
4+□=4		0+□=3		
4 -2	3 -3	5 -4	2 -1	5 -2
5 -5	4 -3	2 -0	3 -1	1 -0

53

unit

9

Subtracting from Minuends to 9

Basal Reference Since this unit is a continuation of the book activities in Unit 8, the Basal Reference is the same as for Unit 8.

As in Unit 8, the first objective deals with missing addends. If your basal text does not cover missing addends as an introduction or support activity for subtraction, feel free to skip Objective 47, or use it at a time more suitable to the curriculum.

Fingermath Prerequisites Units 1 through 5 and Unit 8

*Objective 47 (TE page 111)** *The pupil can supply a missing addend in a number equation with sums to 7.*
Book Activity 47 (page 54)**

Objective 48 (TE page 113) *The pupil can subtract one number from another with minuends to 7.*
Book Activity 48A (page 55)
Book Activity 48B (page 56)

Objective 49 (TE page 115) *The pupil practices and memorizes basic subtraction facts.*
Game Activity 49A
Game Activity 49B
Class Activity 49

Objective 50 (TE page 116) *The pupil can correctly complete arithmetic exercises involving either addition or subtraction, without confusing the operations.*
Book Activity 50 (page 57)

Objective 51 (TE page 117) *The pupil can supply a missing addend in a number equation with sums to 9.*
Book Activity 51 (page 58)

Objective 52 (TE page 118) *The pupil can subtract one number from another with minuends to 9.*
Book Activity 52A (page 59)
Book Activity 52B (page 60)

Objective 53 (TE page 120) *The pupil practices and memorizes basic subtraction facts.*
Game Activity 53A
Game Activity 53B

Objective 54 (TE page 121) *The pupil can correctly complete arithmetic exercises involving either addition or subtraction, without confusing the operations.*
Book Activity 54 (page 61)

Objective 55 (TE page 122) *The pupil can combine addition and subtraction in the same example.*
Book Activity 55 (page 62)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 47

The pupil can supply a missing addend in a number equation with sums to 7.

Synopsis

Since work with missing addends is still relatively new, it is advisable to ask individual pupils to verbalize the procedure. This serves both as a review and as a diagnostic tool for you. If your basal text does not cover missing addends, skip this objective.

Warm-up

Unit counting to 7.

Book Activity 47
(page 54)

Board:

$$3 + 4 = \square$$

Begin by reminding the class to press the second number by ones.

Point to the 3. THIS TELLS ME TO PRESS THREE FINGERS. NOW YOU PRESS THREE FINGERS. Three. HOLD THAT PRESS NOW. Point to the 4. THIS TELLS ME TO PRESS FOUR MORE FINGERS. NOW YOU PRESS FOUR MORE FINGERS. One, two, three, four. Point to the box. THIS BOX ASKS ME HOW MANY FINGERS I HAVE PRESSED. HOW MANY FINGERS HAVE YOU PRESSED? Seven. GOOD. Write 7 in the box.

Board:

$$4 + \square = 9$$

Point to the 4. THIS TELLS ME TO PRESS FOUR. NOW YOU PRESS FOUR FINGERS. Four. HOLD THAT PRESS NOW.

Point to the box. THIS BOX ASKS US *HOW MANY MORE FINGERS* MUST WE PRESS (point to the 9) SO THAT WE END UP WITH NINE PRESSED? COUNT ALONG WITH ME TO SEE HOW MANY MORE MUST BE PRESSED. LET'S START FROM ONE. BEGIN! One, two, three, four, five. THERE IT IS! FIVE! I NEEDED FIVE MORE TO END UP WITH NINE. SO, WHAT DO I WRITE IN THE BOX? Five. Write 5 in the box. LET'S DO THAT ONE AGAIN. Repeat and explain.

Board:

$$0 + \square = 7$$

Go through the same pattern with the class. Then have the class open their books to page 54.

For each example, ask a different child to come to the board and lead the class, using the same verbalization pattern. Be sure the children repeat the pattern correctly.

WRITE THE MISSING NUMBER IN THE BOX.

4 + ☐ = 5	4 + ☐ = 6
1 + ☐ = 6	2 + ☐ = 3
3 + ☐ = 4	0 + ☐ = 5
1 + ☐ = 3	3 + ☐ = 7
3 + ☐ = 5	1 + ☐ = 2
1 + ☐ = 4	0 + ☐ = 4
2 + ☐ = 6	4 + ☐ = 6
5 + ☐ = 7	1 + ☐ = 7
2 + ☐ = 4	2 + ☐ = 5
3 + ☐ = 6	0 + ☐ = 3
1 + ☐ = 5	5 + ☐ = 6
4 + ☐ = 7	2 + ☐ = 7

54

OBJECTIVE 48

The pupil can subtract one number from another with minuends to 7.

Reverse counting from 7.

Warm-up

Board:

Book Activity 48A
(page 55)

6 – 6 = __	6 – 5 = __	6 – 4 = __
6 – 3 = __	6 – 2 = __	6 – 1 = __

Discourage attempts to direct clear.

I WOULD LIKE A VOLUNTEER TO COME TO THE BOARD AND DEMONSTRATE HOW TO DO THE FIRST EXAMPLE.

Make sure that the children verbalize something like this: Press six. Six, or Five, six. Clear six. One, two, three, four, five, six. Read your fingers. Zero. The pupil writes 0 in the answer space. After volunteers have done the other board examples, have them turn to page 55. Again, have different children lead the class in verbalizing each subtraction example.

Board:

Book Activity 48B
(page 56)

7 – 7 = __	7 – 6 = __	7 – 5 = __
7 – 4 = __	7 – 3 = __	7 – 2 = __
7 – 1 = __		

Discourage attempts to direct clear.

COULD I HAVE A VOLUNTEER COME TO THE BOARD AND DEMONSTRATE HOW TO DO THE FIRST EXAMPLE?

Make sure that the children verbalize something like this: Press seven. Seven; or Five, six, seven. Clear seven. One, two, three, four, five, six, seven. Read your fingers. Zero.

The pupil writes 0 in the answer space. After volunteers have done the other board examples, have them turn to page 56. Again, have different children lead the class in verbalizing each subtraction example.

SUBTRACT AND WRITE THE ANSWER.

5-3 =	6-0 =
3-0 =	4-2 =
4-4 =	5-4 =
2-1 =	3-1 =
6-3 =	6-4 =
4-1 =	5-1 =
6-5 =	3-2 =
3-3 =	6-6 =
6-1 =	5-2 =
2-2 =	4-0 =
4-3 =	6-2 =
5-5 =	5-0 =

55

SUBTRACT AND WRITE THE ANSWER.

7-4 =	5-3 =
5-2 =	7-3 =
6-5 =	6-1 =
3-2 =	3-1 =
7-2 =	5-4 =
5-5 =	7-5 =
4-1 =	4-4 =
6-3 =	6-6 =
7-6 =	4-3 =
5-1 =	7-7 =
3-3 =	4-2 =
6-4 =	7-1 =

56

OBJECTIVE 49

The pupil practices and memorizes basic subtraction facts.

This is one more part of a continuing program of building skills. **Synopsis**

Pressing to 7; clearing from 7. **Warm-up**

CLEAR GAME **Game Activity 49A**

Materials: A set of large flash cards for the following subtractions: 6 – 6, 6 – 5, 6 – 4, 6 – 3, 6 – 2, 6 – 1, 6 – 0. Also, any previous subtraction facts with which the class still appears insecure.

TODAY WE WILL PLAY THE CLEAR GAME. AS SOON AS YOU SEE THE CARD WITH THE SUBTRACTION FACT, PRESS THE ANSWER IF YOU CAN.

Go through the examples once visually with cards and once orally.

CLEAR GAME **Game Activity 49B**

Materials: A set of large flash cards for the following subtractions: 7 – 7, 7 – 6, 7 – 5, 7 – 4, 7 – 3, 7 – 2, 7 – 1, 7 – 0. Also, any previous subtraction facts with which the class still appears insecure.

TODAY WE WILL PLAY THE CLEAR GAME. AS SOON AS YOU SEE THE CARD WITH THE SUBTRACTION EXAMPLE, PRESS THE ANSWER IF YOU CAN.

Go through the examples, once visually with cards and once orally.

Internalization Drill: **Class Activity 49**

This is another in the series of exercises that provide the teacher with an indication of how well the children are learning subtraction facts, achieved through Fingermath and other classwork.

Materials: Flashcards of minuends to 7, used in previous activities.

EVERYBODY SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE ANSWER TO THE SUBTRACTION EXAMPLE, RAISE YOUR LEFT HAND SO I CAN CALL ON YOU.

Display each card in random order and record results.

OBJECTIVE 50

The pupil can correctly complete arithmetic exercises involving either addition or subtraction, without confusing the operations.

Warm-up Pressing to 9; clearing from 9.

Book Activity 50 (page 57)

Board:

5 – 3 = _
2 + 4 = _

Discuss with the class the fact that you are mixing addition and subtraction examples, as shown by the two examples on the board. On page 57, work the first two sets of four examples with the class. In each case, first ask the class whether the example is addition or subtraction. Then allow them to do succeeding sets of four by themselves. Be sure to check answers after each set of four.

DO EACH EXAMPLE. WRITE THE ANSWER.

5−1=	7−4=
7−2=	2+3=
1+3=	1+6=
4−1=	6−3=
5−3=	5+2=
3+4=	3+3=
4+1=	7−5=
4−3=	3+4=
7−1=	1+5=
5−4=	5−5=
4+2=	2+5=
7−3=	7−6=

57

OBJECTIVE 51

The pupil can supply a missing addend in a number equation with sums to 9.

Synopsis

Since work with missing addends is still relatively new, it is advisable to ask individual pupils to verbalize the procedure. This serves both as a review and as a diagnostic tool. The pupil must first have completed Objectives 38 and 47 which introduced the subject of missing addends.

Book Activity 51
(page 58)

Vocabulary

Missing addend

Board:

5 + ☐ = 8	3 + ☐ = 9

After working through the examples on the board with individual pupils verbalizing before the class, ask everyone to turn to page 58. Lead them through the first few examples, and then let them continue on their own. Be sure to check their answers.

Introduce the term *missing addend.*

WRITE THE MISSING NUMBER IN THE BOX.

1+☐=9	1+☐=5
4+☐=7	4+☐=8
3+☐=8	3+☐=9
2+☐=6	4+☐=6
4+☐=9	5+☐=9
2+☐=7	1+☐=8
5+☐=8	3+☐=5
1+☐=6	1+☐=7
6+☐=9	6+☐=8
3+☐=7	5+☐=7
8+☐=8	7+☐=9
2+☐=9	3+☐=6

58

OBJECTIVE 52

The pupil can subtract one number from another with minuends to 9.

Warm-up Clearing from 9; direct pressing to 9.

Book Activity 52A (page 59) Board:

8 – 8 = __	8 – 7 = __	8 – 6 = __	8 – 5 = __
8 – 4 = __	8 – 3 = __	8 – 2 = __	8 – 1 = __

Discourage attempts to direct clear.

I WOULD LIKE A VOLUNTEER TO COME TO THE BOARD AND DEMONSTRATE HOW TO DO THE FIRST EXAMPLE.

Make sure that the pupil verbalizes something like this: Press eight. Eight. Clear eight. One, two, three, four, five, six, seven, eight. Read your fingers. Zero. The pupil writes 0 in the answer space. After volunteers have done the other board examples, have them turn to page 59. Again, have different children lead the class in verbalizing each subtraction example.

Book Activity 52B (page 60) Board:

9 – 9 = __	9 – 6 = __	9 – 3 = __
9 – 8 = __	9 – 5 = __	9 – 2 = __
9 – 7 = __	9 – 4 = __	9 – 1 = __

COULD I HAVE A VOLUNTEER COME TO THE BOARD AND DEMONSTRATE HOW TO DO THE FIRST EXAMPLE?

Make sure that the pupil verbalizes something like this: Press nine. Nine. Clear nine. One, two, three, four, five, six, seven, eight, nine. Read your fingers. Zero.

The pupil writes 0 in the answer space. After volunteers have done the other board examples, have them turn to page 60. Again, have different children lead the class in verbalizing each subtraction example.

SUBTRACT AND WRITE THE ANSWER.

7-4 =	5-2=
8-3 =	7-5=
5-4 =	8-8=
6-2 =	6-3=
7-7 =	7-1 =
8-1 =	8-2=
6-4=	5-3=
5-5 =	8-7=
7-2=	6-5=
8-6=	8-5=
7-3=	7-6=
8-4=	6-6=

59

SUBTRACT AND WRITE THE ANSWER.

9-6=	7-2=
7-7=	9-4=
8-3=	8-6=
9-2=	7-6=
8-7=	9-5=
7-4=	8-2=
9-8=	7-1=
8-4=	9-3=
9-1 =	7-5=
7-3=	9-9=
8-8=	8-5=
9-7=	8-1=

60

OBJECTIVE 53

The pupil practices and memorizes basic subtraction facts.

Synopsis This is one more part of a continuing program of building skills.

Warm-up Direct pressing to 9; clearing from 9.

Game Activity 53A CLEAR GAME

Materials: A set of large flash cards for the following subtractions: 8 – 8, 8 – 7, 8 – 6, 8 – 5, 8 – 4, 8 – 3, 8 – 2, 8 – 1, 8 – 0. Also, any previous subtraction facts with which the class still appears insecure.

TODAY WE ARE DOING THE CLEAR GAME. AS SOON AS YOU SEE THE CARD WITH THE SUBTRACTION EXAMPLE, PRESS THE ANSWER IF YOU CAN.

Go through the examples once visually with cards and once orally.

Game Activity 53B CLEAR GAME

Materials: A set of large flash cards for the following subtractions: 9 – 9, 9 – 8, 9 – 7, 9 – 6, 9 – 5, 9 – 4, 9 – 3, 9 – 2, 9 – 1, 9 – 0. Also, any previous subtraction facts with which the class still appears insecure.

TODAY WE WILL PLAY THE CLEAR GAME. AS SOON AS YOU SEE THE CARD WITH THE SUBTRACTION EXAMPLE, PRESS THE ANSWER IF YOU CAN.

Go through the examples once visually with cards and once orally.

OBJECTIVE 54

The pupil can correctly complete arithmetic exercises involving either addition or subtraction, without confusing the operations.

Direct pressing to 9; clearing from 9.

Warm-up

Board:

$9 - 7 = _$
$6 + 3 = _$

Book Activity 54
(page 61)

Discuss with the class the fact that you are mixing addition and subtraction examples, as shown by the two examples on the board. On page 61, work the first two sets of four examples with the class. In each case, first ask the class whether the example is addition or subtraction. After helping the class with the first two sets of four, allow them to do succeeding sets of four by themselves. Be sure to check their answers after each set of four.

DO EACH EXAMPLE. WRITE THE ANSWER

8-6=	7-6 =
6+3=	6-3=
4+4=	5+4=
6-4=	9-7=
9-8=	7+2=
5+2=	4+2=
7-4=	7-5=
5+3=	6+2=
9-6=	8-5=
6+1=	7+1=
8-7=	6-5=
4+5=	4+3=

61

OBJECTIVE 55

The pupil can combine addition and subtraction in the same example.

Synopsis This activity is easy because of Fingermath's unique capacity for storing subtotals. It also teaches the child to manipulate the fingers backwards and forwards in the same examples.

Warm-up Pressing and clearing several numbers 1 to 9 interchangeably on command, with no subtotal or minuend exceeding 9.

Book Activity 55 (page 62) Board:

9 – 6 + 4 = __	3 + 5 – 6 = __
4 – 2 + 7 = __	5 + 4 – 7 = __

Have volunteers come to the board and verbalize as they fingerpress the example. Sample verbalizations might be: PRESS NINE. Nine, SUBTRACT SIX. One, two, three, four, five, six. ADD FOUR. One, two, three, four. READ YOUR FINGERS. Seven.

Other than a direct press of the first number, be certain all other numbers are added or subtracted, one by one, always beginning with a new count of one.

Now turn to page 62. Do each of the examples with the class, first having individuals verbalize and press the example, followed by the entire class verbalizing and pressing the example and writing their answers.

unit 10

Counting by 10s to 90: Left-Hand Finger-pressing

Basal Reference

1. Verbal counting by 10s to 90.
2. Number names and numerals 10 to 90.
3. Number symbols in the form: one 10, two 10s, three 10s, etc.
4. Use of objects to count groups of 10.

Fingermath Prerequisites

Units 1 through 7

*Objective 56 (TE page 125)**

The pupil can press and verbalize in sequence the numbers 10 through 90, first by 10s and then direct.

Class Activity 56

Objective 57 (TE page 126)

The pupil can match to set pictures the fingerpressing of 10s to 90.

Book Activity 57A (page 63)**
Book Activity 57B (page 64)

Objective 58 (TE page 128)

The pupil can match the decades from 10 to 90 to hand pictures and can identify the decades through 90 by name and by numeral.

Book Activity 58A (page 65)
Book Activity 58B (page 66)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 56

The pupil can press and verbalize in sequence the numbers 10 through 90, first by 10s and then direct. (See The Complete Book of Fingermath, *pages 45–60.)*

Synopsis

This objective closely parallels the earlier objective on counting from 1 to 9. Spend time on this unit to be certain that pupils have a sense of what values are represented by the press of the fingers of the left hand. This activity links the written symbols for the numbers 10 through 90 to the fingerpress position. While the pupils usually are introduced to number symbols first in the form *one ten, two tens,* to *nine tens,* many children know the number names and numerals 10 through 90 and should be encouraged to use them.

Class Activity 56

WE'VE ALL LEARNED HOW TO COUNT BY TENS. LET'S DO IT TOGETHER UP TO 90. Ten, twenty, thirty, forty, fifty, sixty, seventy, eighty, ninety. NOW WE'RE READY TO USE OUR LEFT HANDS FOR FINGERMATH. THE LEFT HAND IS USED TO COUNT TENS IN THE SAME WAY THAT THE RIGHT HAND COUNTS ONES. WATCH ME FIRST. Go to the board and demonstrate by pressing. HERE'S THE RIGHT HAND. ONE, TWO, THREE, FOUR, FIVE, SIX, SEVEN, EIGHT, NINE. AND HERE'S THE LEFT HAND. TEN, TWENTY, THIRTY, FORTY, FIFTY, SIXTY, SEVENTY, EIGHTY, NINETY. LOOK AT MY LEFT HAND ONCE MORE. Repeat the press and count of 10 to 90. DID YOU SEE THAT WHEN I GOT TO FORTY (press 40 on board.) AND I WANTED TO GO ON TO FIFTY, I USED THE FLIPPER, LIKE THIS. Press the 40 to 50 exchange. FORTY, FIFTY. AGAIN: FORTY, FIFTY. NOW LET'S ALL CLEAR OUR FINGERS AND COUNT BY TENS TO NINETY. BEGIN! The class counts to 90. Repeat several times. Then have individual pupils come to the front to demonstrate and verbalize this series while the class follows.

OBJECTIVE 57

The pupil can match to set pictures the fingerpressing of 10s to 90.

Materials: Enough counting sticks to make nine groups of ten sticks each, one group of five sticks, and four single sticks.

Book Activity 57A (page 63)

Hold up a bundle of sticks and remind the class of the pipe cleaners that they tied to their index fingers. Ask them to pretend that each of the four fingers on their left hands has a bundle of ten pipe cleaners tied to it. Hold up two bundles of ten sticks and ask the class to name the number represented. Accept either two tens or twenty. Then have the class press their left index and middle fingers and say either two tens or twenty. In turn, hold up three tens sticks and then four, following the same procedure and having the pupils fingerpress and verbalize. Special attention must be given to the way to press fifty. Bundle five groups of ten sticks into one bundle of fifty, hold it up, and ask for a volunteer to suggest a way to press five 10s or 50. Again suggest that they pretend that each of them has 5 bundles of ten pipe cleaners tied to the left thumb. Then continue to count to 90 in the same manner.

Next have the class direct press the decades in random order. Finally, mix direct pressing of decades (10, 20, 30, 40, 50, 60, 70, 80, 90) alternately with direct pressing of units (1, 2, 3, 4, 5, 6, 7, 8, 9). Do not attempt to combine both in a single press. Then have the class turn to page 63. Help with the example exercises, having the class press their own fingers and then color in the fingers of the hands in the book.

Book Activity 57B (page 64)

Begin by mixing direct press activity of decades and units, with the class responding orally.

PRESS SEVEN. READ YOUR FINGERS. CLEAR YOUR FINGERS.
PRESS SIX TENS. . . .
PRESS NINETY. . . .

PRESS FORTY. . . .
PRESS FOUR TENS. . . .
PRESS SIX. . . .

PRESS FIFTY. . . .

PRESS EIGHT. . . .

PRESS TEN. . . .
PRESS TWO TENS. . . .
PRESS FOUR. . . .

PRESS NINE. . . .

PRESS TWENTY. . . .
PRESS EIGHT TENS. . . .

PRESS SEVENTY. . . .

PRESS THREE. . . .

PRESS SIXTY. . . .
PRESS FIVE TENS. . . .
PRESS FIVE. . . .

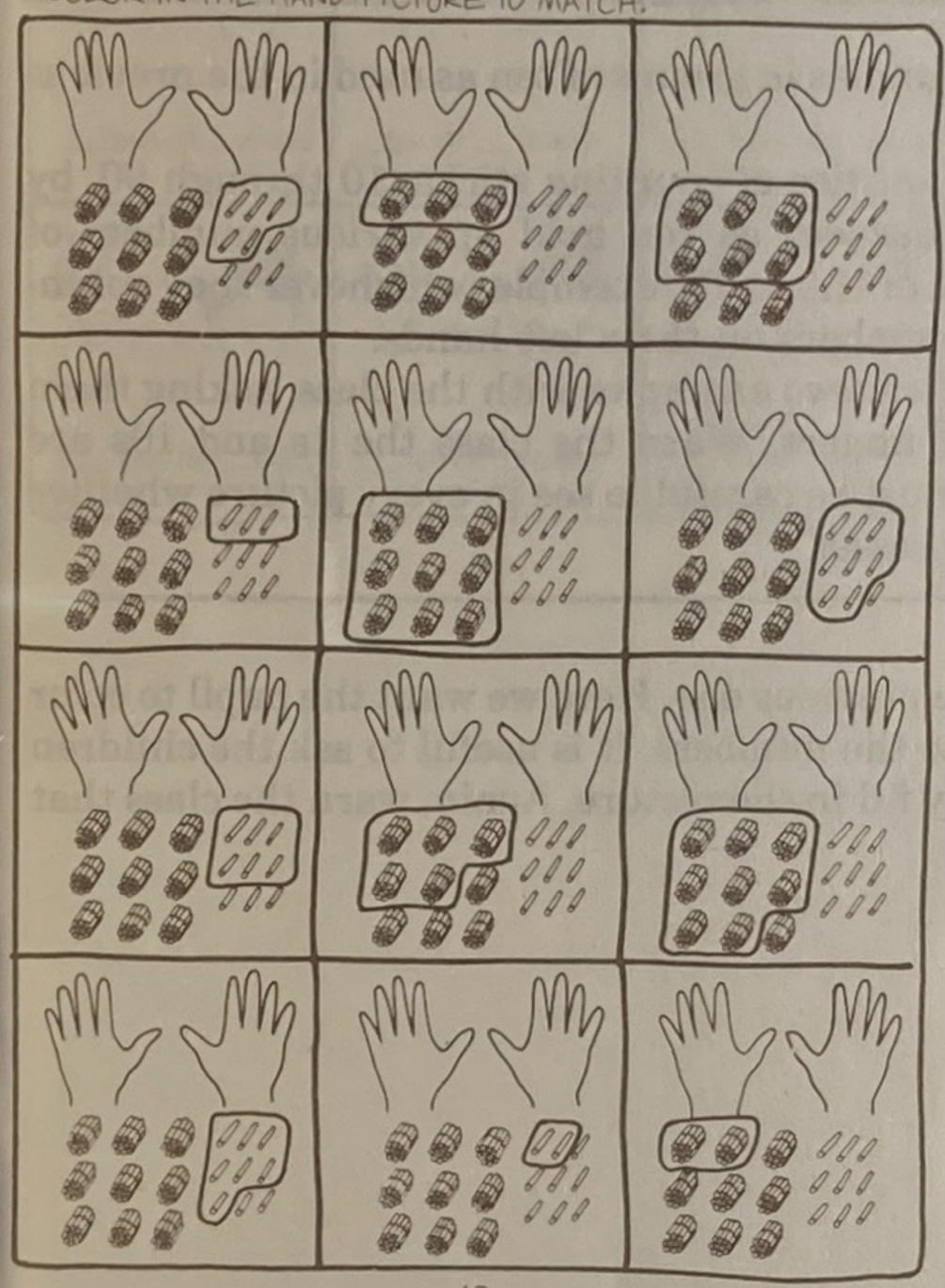
PRESS EIGHTY....
PRESS THREE TENS.....
PRESS TWO....

PRESS THIRTY....
PRESS NINE TENS....
PRESS ONE....

PRESS SEVEN TENS....

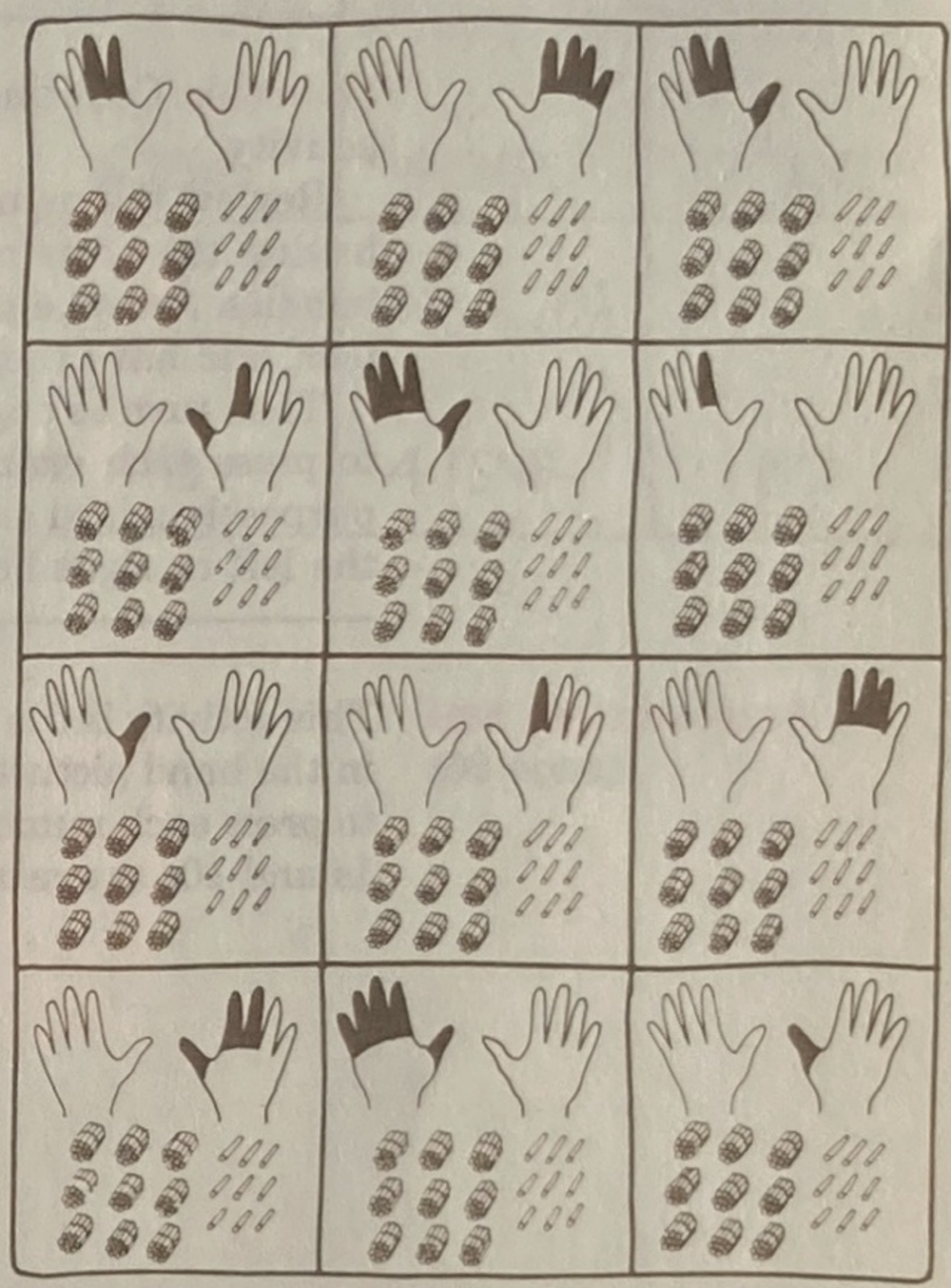
Then have the class open their books to page 64. Have the pupils read and direct press the hand pictures and circle the correct number of sticks.

PRESS THE AMOUNT OF STICKS CIRCLED. THEN, COLOR IN THE HAND PICTURE TO MATCH.



63

PRESS THE HAND PICTURE SHOWN. THEN CIRCLE THE CORRECT BUNDLE COUNT.



64

OBJECTIVE 58

The pupil can match the decades from 10 to 90 to hand pictures and can identify the decades through 90 by name and by numeral.

Synopsis The activity follows automatically from the previous activity. It links the fingerpressing to the writing of the number and its set form.

Warm-up Press decades and verbalize from 10 to 90.

Book Activity 58A (page 65)

Board:

1 ten = 10; 2 tens = 20; 3 tens = 30; 4 tens = 40;
5 tens = 50; 6 tens = 60; 7 tens = 70; 8 tens = 80; 9 tens = 90

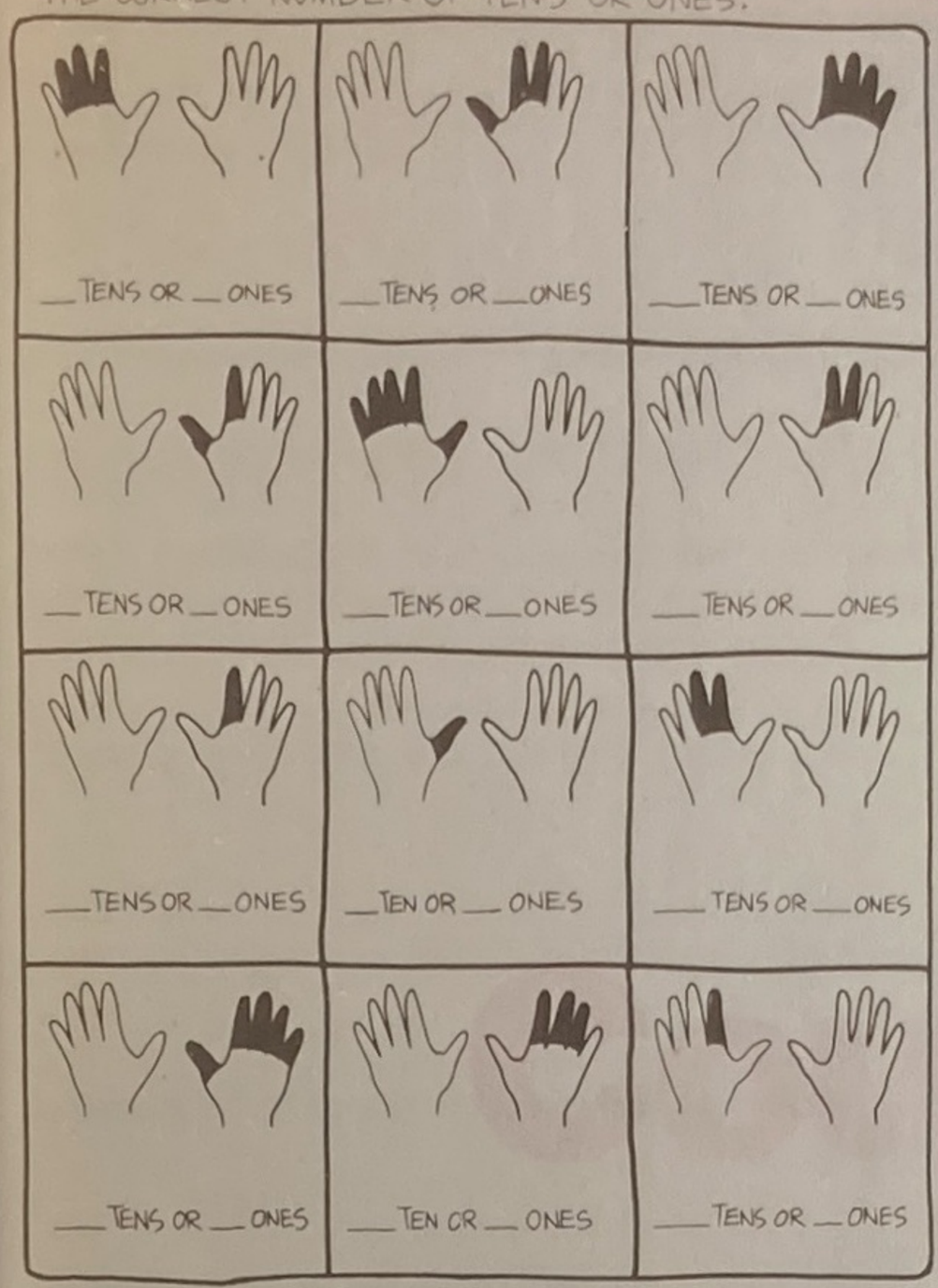
Materials: Counting sticks and bundles in groups of ten as used in the previous activity.

Review the names for the quantities of counting sticks, 10 through 90, by having the class name all the decades as you hold up various numbers of bundles. Accept either three tens or thirty, for example, whichever they volunteer, and have them press the numbers on their left hands.

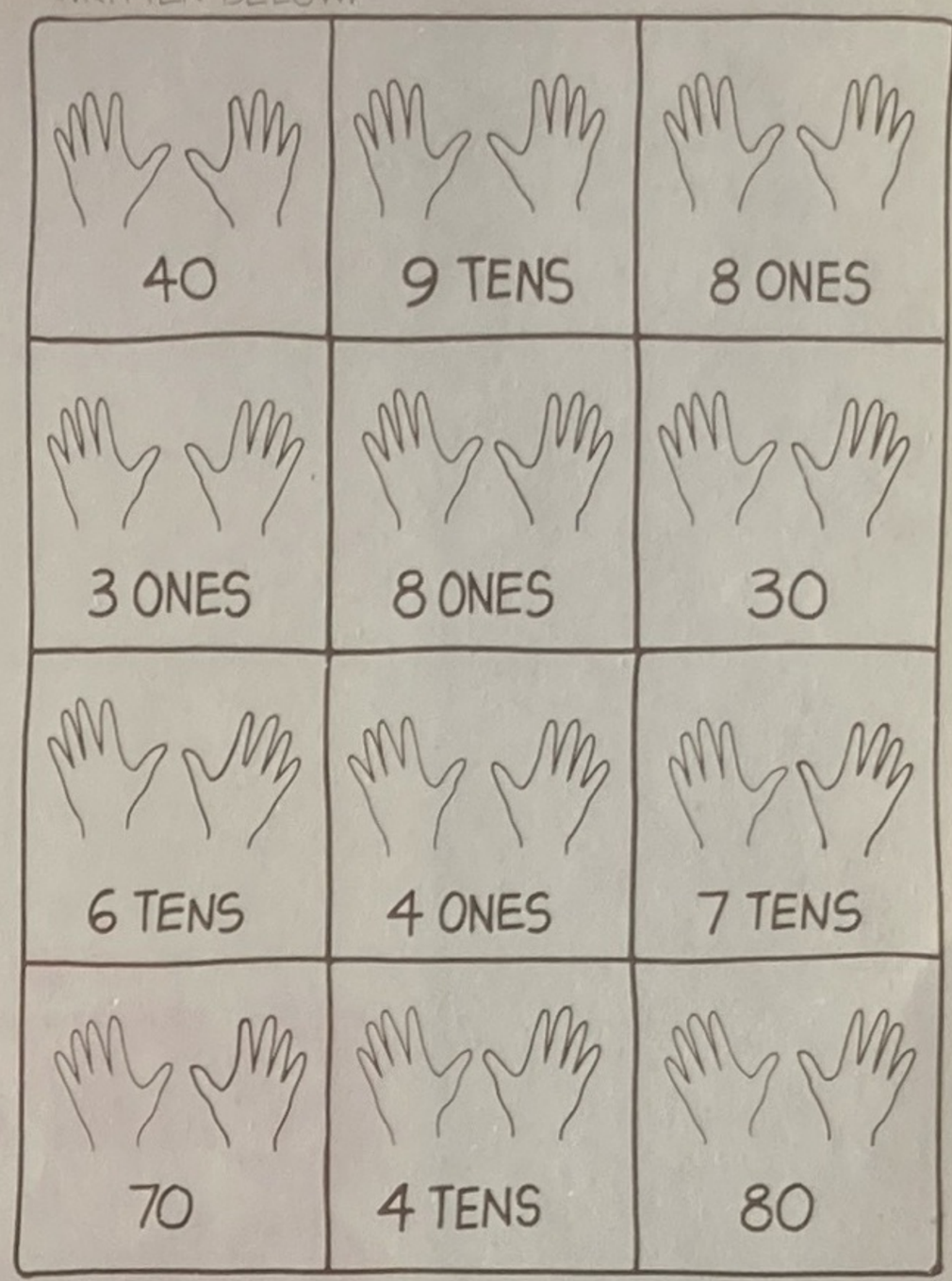
Then turn to page 65. Do the first two examples with the class, asking them to press each example on their fingers. Warn the class the 1s and 10s are purposely mixed and that they must be careful to see in every picture whether the left or right hand is being pressed.

Book Activity 58B (page 66) This activity is the reverse of the previous one. Here we want the pupil to color in the hand pictures according to the numbers. It is useful to ask the children to press each number before they fill in the picture. Again, warn the class that 1s and 10s are mixed purposely.

PRESS THE AMOUNT SHOWN ON THE HAND. WRITE IN THE CORRECT NUMBER OF TENS OR ONES.



COLOR THE FINGERS TO SHOW THE NUMBER WRITTEN BELOW.



unit

11

Counting to 19

Basal Reference

1. Concrete experience with counting by 10s to 90 and by 1s to 19.
2. Place value in two-digit numbers.
3. The use of physical objects in working with place value.

Fingermath Prerequisites

Units 1 through 10

Objective 59 (TE page 133)

The pupil can fingerpress 10 and distinguish between the press of the left and right index fingers.

Class Activity 59

Objective 60 (TE page 134)

The pupil can fingercount to 10 by 1s, manipulating the 9 to 10 exchange called the little hopper.

Class Activity 60

Objective 61 (TE page 137)

The pupil can fingerpress, identify, and match numerals, sets, and hand pictures of quantities up to 11.

Class Activity 61
Book Activity 61A (pages 67 and 68)
Book Activity 61B (pages 69 and 70)
Game Activity 61

Objective 62 (TE page 140)

The pupil can fingerpress, identify, and match numerals, sets, and hand pictures of quantities up to 12.

Class Activity 62
Book Activity 62A (pages 71 and 72)
Book Activity 62B (pages 73 and 74)
Game Activity 62

Objective 63 (TE page 143)

The pupil can fingerpress, identify, and match numerals, sets, and hand pictures of quantities up to 13.

Class Activity 63
Book Activity 63A (pages 75 and 76)
Book Activity 63B (pages 77 and 78)
Game Activity 63

Objective 64 (TE page 146)

The pupil can fingerpress, identify, and match numerals, sets, and hand pictures of quantities up to 14.

Class Activity 64
Book Activity 64A (pages 79 and 80)
Book Activity 64B (pages 81 and 82)
Game Activity 64

Objective 65 (TE page 149)

The pupil can manipulate the 14 to 15 exchange.

Class Activity 65

Objective 66 (TE page 150)

The pupil can compare sets of ten to nineteen objects to hand pictures and can press these values.

Book Activity 66 (page 83)

Objective 67 (TE page 151)

The pupil can press, read, and match fingerpress positions 10 through 19 with hand pictures and numerals.

Book Activity 67A (page 84)
Book Activity 67B (page 85)
Game Activity 67

Objective 68 (TE page 153)

The pupil can direct press 0 through 19.

Class Activity 68

OBJECTIVE 59

The pupil can fingerpress 10 and distinguish between the press of the left and right index fingers.

Synopsis

This review lays the groundwork for a smooth fingerpress transition from 9 to 10.

Warm-up

Counting by 1s to 9; direct pressing to 9.

Class Activity 59

PRESS NINE, ONE BY ONE. One, two, three, four, five, six, seven, eight, nine. WHEN WE HAVE PRESSED NINE, WE HAVE USED UP ALL THE FINGERS ON OUR RIGHT HAND. THERE ARE NO MORE FINGERS *AVAILABLE*. Turn your back to the class and hold up your right hand as illustrated below.

THE FINGERS OF THE RIGHT HAND COUNT ONLY ONES. Point to the right-hand fingers. Then hold up the left hand in the same manner, still with your back to the class. THE FINGERS OF THE LEFT HAND COUNT ONLY TENS. Point to left-hand fingers. IF I PRESS MY RIGHT INDEX FINGER (Press it to the board for all to see) I COUNT ONE. SAY "ONE." One. IF I PRESS MY LEFT INDEX FINGER (press it to the board) I COUNT TEN. SAY "TEN." Ten. EVERYONE, FINGERS OF BOTH HANDS READY. PRESS ONE One. READ YOUR FINGERS. One. CLEAR YOUR FINGERS. PRESS TEN. Ten. READ YOUR FINGERS. Ten. CLEAR YOUR FINGERS. PRESS ONE. One. READ YOUR FINGERS. One. CLEAR YOUR FINGERS. PRESS TEN. Ten. READ YOUR FINGERS. Ten. CLEAR YOUR FINGERS.

Now have the children direct press each of the numbers from 1 through 10 repeatedly, both in and out of sequence.

OBJECTIVE 60

The pupil can fingercount to 10 by 1s, manipulating the 9 to 10 exchange called the little hopper.

Synopsis The story that follows will help children to link the 9 to 10 exchange with the mnemonic *little hopper,* which can be used later if a pupil forgets how to press from 9 to 10. The preceding lesson has further established the left index finger as a 10 counter. In addition to finger-by-finger pressing and the 4 to 5 exchange (the little flipper), the little hopper is one more Fingermath operation that adds 1.

At this stage, it is important that the child makes a deliberate 9 to 10 exchange (a hop), and associates the hop with adding 1 to the count.

(See *The Complete Book of Fingermath,* pages 62–64.)

Warm-up Unit counting to 9; direct pressing to 10; clearing from 9.

Class Activity 60 HOW DO WE GET FROM FOUR TO FIVE IN FINGERMATH? The little flipper; the four to five exchange.

TODAY WE ARE GOING TO MEET ANOTHER FRIEND, CALLED THE LITTLE HOPPER.

THE LITTLE HOPPER HELPS US TO GET FROM NINE TO TEN ON OUR FINGERS. I AM GOING TO TELL YOU A STORY ABOUT A RABBIT OF THE SAME NAME, LITTLE HOPPER. BUT BEFORE I DO, I WANT TO SHOW YOU WHAT THE LITTLE HOPPER DOES, SO THAT WHEN I TELL YOU THE STORY, YOU CAN PRESS YOUR FINGERS ALONG WITH ME. WATCH!

ONE BY ONE, PRESS NINE. One, two, three, four, five, six, seven, eight, nine. WHENEVER I HAVE PRESSED NINE ON MY RIGHT HAND AND I WANT TO ADD ONE MORE, I NEED THE LITTLE HOPPER. HE TAKES US FROM NINE TO TEN LIKE THIS. Demonstrate at the board with your back to the class.

Emphasize the instruction that when a hop is made, everyone throws the right hand high overhead, to help the teacher keep track of group action and to make sure they are clearing the right hand. Also stress the simultaneous press of 10.

DO YOU ALL STILL HAVE NINE PRESSED? Yes. THEN *YOU* TRY THE LITTLE HOPPER. SAY "NINE, TEN."

Practice repeatedly, going from child to child and observing technique and verbalization. Explain that, during the telling of the story of Little Hopper, they are to press another finger each time Little Hopper tries to jump the fence. As in the story of Little Flipper, the narrative is marked by asterisks at the points where you instruct the class to press first one finger, then one more, then one more, and so on up to ten, when the little hopper is executed.

The Little Hopper

WHEN MR. AND MRS. RABBIT HAD THEIR THIRD LITTER OF BABY RABBITS, ONE RABBIT ESPECIALLY STOOD OUT FROM THE OTHERS BECAUSE HE LOVED TO HOP.

HOP, HOP . . . HOP, HOP. HE WOULD JUMP ALL AROUND THE HOUSE. THAT IS WHY HIS PARENTS DECIDED TO CALL HIM LITTLE HOPPER. HOPPER WAS A HAPPY LITTLE RABBIT AND NEVER GAVE HIS PARENTS ANY TROUBLE.

OUTSIDE THEIR HOUSE, HIS PARENTS HAD BUILT A HIGH FENCE TO PREVENT THE BABY RABBITS FROM RUNNING INTO THE STREET AND GETTING RUN OVER BY CARS OR TRUCKS BEFORE THEY WERE OLD ENOUGH TO TAKE CARE OF THEMSELVES. EVERY MORNING LITTLE HOPPER WATCHED HIS DADDY LEAVE FOR WORK. HIS DADDY WOULD SIMPLY HOP OVER THE FENCE AND OFF HE WOULD GO TO HIS JOB.

OH, HOW LITTLE HOPPER LONGED TO JUMP THE FENCE LIKE HIS DAD AND HIS OLDER BROTHERS AND SISTERS. BUT TRY AS HE MIGHT, HE JUST WASN'T BIG ENOUGH TO JUMP OVER THE HIGH FENCE AND SEE WHAT WAS ON THE OTHER SIDE.

"WHEN WILL I BE TALL ENOUGH TO JUMP OVER THE FENCE?" HE WOULD ASK HIS MOTHER.

"BE PATIENT, HOPPER," HIS MOTHER WOULD SAY. "AFTER ALL, YOU AREN'T EVEN ONE MONTH OLD."

EVERY MONTH, LITTLE HOPPER TOLD HIMSELF, HE WOULD TRY TO JUMP THE FENCE SO THAT HE COULD GET TO THE OTHER SIDE.

AFTER ONE MONTH * LITTLE HOPPER TRIED AGAIN. "MAYBE WHEN I AM TWO MONTHS OLD, I WILL MAKE IT," HE SAID.

WHEN HE WAS TWO MONTHS OLD, ** HE JUST ABOUT REACHED TO THE SECOND BOARD OF THE FENCE.

AT THREE MONTHS, HE JUMPED HIGHER, *** BUT IT WAS STILL A LONG WAY UP TO THE TOP OF THE FENCE. BUT HOPPER KEPT ON PRACTICING AS HARD AS HE COULD.

AFTER FOUR MONTHS, HE HOPPED ALMOST HALFWAY UP THE FENCE. **** HE RAN TO HIS MOTHER TO TELL HER OF HIS PROGRESS.

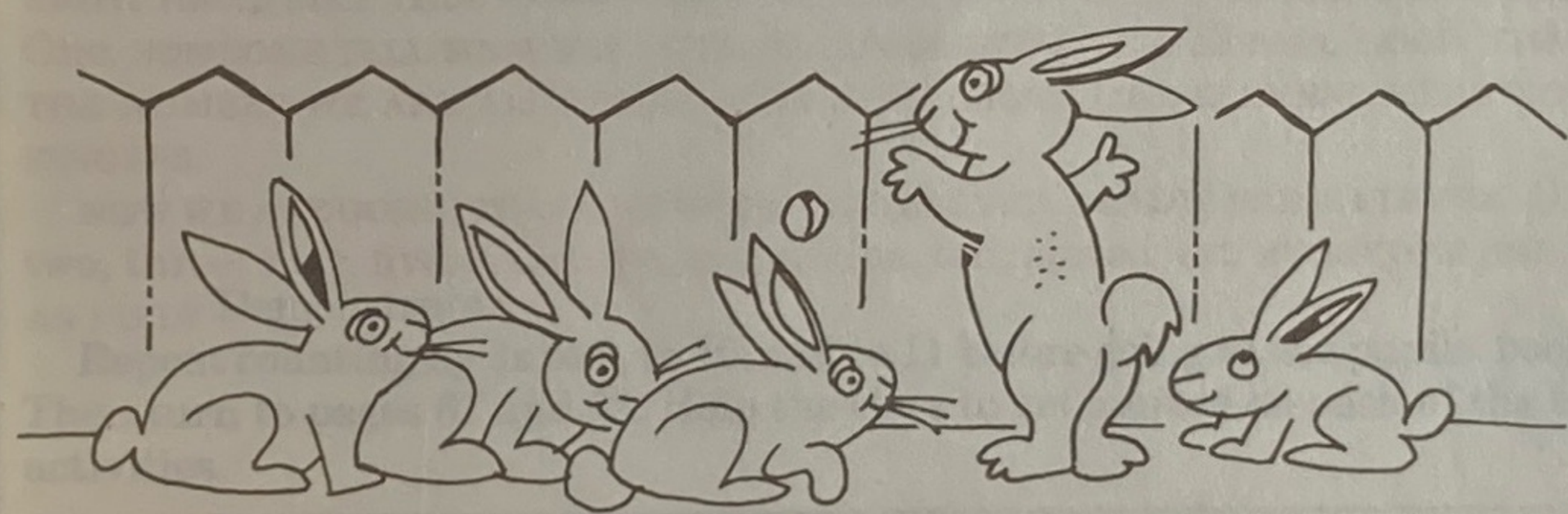
"BE PATIENT, LITTLE HOPPER," HIS MOTHER TOLD HIM. "EVENTUALLY YOU WILL BE ABLE TO JUMP OVER THE FENCE AND TO THE OTHER SIDE JUST LIKE YOUR DADDY AND GROWN-UP SISTERS AND BROTHERS."

WHEN HE WAS FIVE MONTHS OLD ***** HOPPER COULD REACH HALFWAY UP THE BIG FENCE AND HE BOASTED TO HIS FRIENDS THAT HE WOULD JUMP THAT FENCE BEFORE HE WAS A YEAR OLD.

AT SIX MONTHS, ****** HE JUMPED HIGH ENOUGH TO CATCH A GLIMPSE OF THE OUTSIDE WORLD THROUGH A KNOTHOLE IN THE FENCE. IN THE SEVENTH MONTH, ******* HE JUMPED HIGHER THAN EVER, AND HE GOT SO EXCITED ABOUT HIS PROGRESS THAT HE COULDN'T STOP TALKING ABOUT IT. THE OTHER RABBITS WERE GETTING EXCITED TOO, WATCHING HOPPER JUMP, AND WHEN HE WAS EIGHT MONTHS OLD, ******** A CROWD OF YOUNGER RABBITS WAS THERE TO WATCH HIM TRY. "ALMOST!" HE CRIED WITH JOY. "I CAN ALMOST MAKE IT!" SO, WHEN HE WAS NINE MONTHS OLD, ********* EVERYONE IN HIS FAMILY WAS THERE TO WATCH LITTLE HOPPER TRY TO MAKE IT.

"YOU CAN DO IT, LITTLE HOPPER!" THEY CALLED TO HIM.

AND HE ALMOST DID.



"I COULD SEE THE OTHER SIDE," HE TOLD ANYONE WHO WOULD LISTEN. "HONEST! I ACTUALLY JUMPED HIGH ENOUGH TO SEE OVER THE TOP. YOU JUST WAIT UNTIL NEXT MONTH," HE SAID TO HIS MOTHER. "NEXT MONTH, I'LL JUMP THAT FENCE AND *REALLY* BE ON THE OTHER SIDE." WHEN IT WAS BEDTIME, HE WAS SO EXCITED THAT HE COULD HARDLY SLEEP.

"NEXT MONTH," HE SAID TO HIS MOTHER AND FATHER, "I'LL MAKE IT OVER THE FENCE. NEXT MONTH, I'LL FINALLY BE ABLE TO SEE THE OTHER SIDE OF THE FENCE."

YOU CAN JUST IMAGINE THE EXCITEMENT IN THE RABBIT FAMILY WHEN HOPPER

WAS TEN MONTHS OLD. HIS MOTHER AND FATHER GATHERED AT THE FENCE WITH ALL OF HIS SISTERS AND BROTHERS, AND EVEN SOME NEIGHBORS WHO HAD HEARD ABOUT LITTLE HOPPER.

"NINE TIMES I HAVE TRIED TO JUMP THIS FENCE," HE SAID. *(Make sure everyone is still pressing nine.)* "BUT TODAY I AM TEN MONTHS OLD, AND THIS TIME I AM GOING TO MAKE IT!" AND WITH THAT HE TOOK A DEEP BREATH, AND WITH EVERYONE WATCHING BREATHLESSLY, HE HOPPED OVER THE FENCE TO THE OTHER SIDE.

****

(Have everyone press the index finger of the left hand and raise the right hand high.)

"I'VE DONE IT! I'VE DONE IT!" HE SHOUTED, WHILE ALL HIS FRIENDS AND RELATIVES CHEERED AND CHEERED.

"HURRAY, HURRAY! I AM TEN MONTHS OLD AND I'VE JUMPED TO THE OTHER SIDE!"

IT WAS A WONDERFUL DAY FOR LITTLE HOPPER.

Conclude this lesson by having the class practice pressing from 1 to 10, one by one, making the 9 to 10 exchange. Repeat several times.

OBJECTIVE 61

The pupil can press, identify, and match numerals, sets, and hand pictures of quantities up to 11.

Synopsis

This activity is not to be thought of as the operation of addition but as sequential pressing and counting. For that reason, insist that the children press all numbers finger by finger, one by one.

Warm-up

Unit counting to 10; 9 to 10 exchange; 4 to 5 exchange.

Class Activity 61

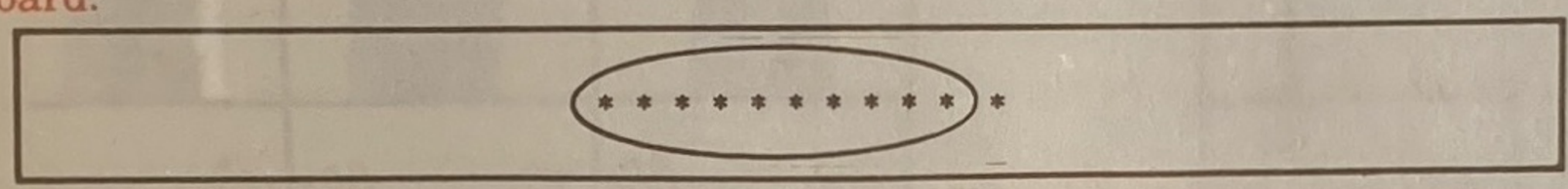
Board:

* * * * * * * * * *	6
* * * * * * * * *	7
* * * * * *	8
* * * * * * * *	9
* * * * * * *	10

Have a volunteer come to the board, count and point to the row of six stars. Next have the volunteer circle the numeral 6 and press 6. In like manner have individual children do 7, 8, 9, and 10.

Book Activity 61A
(pages 67 and 68)

Board:

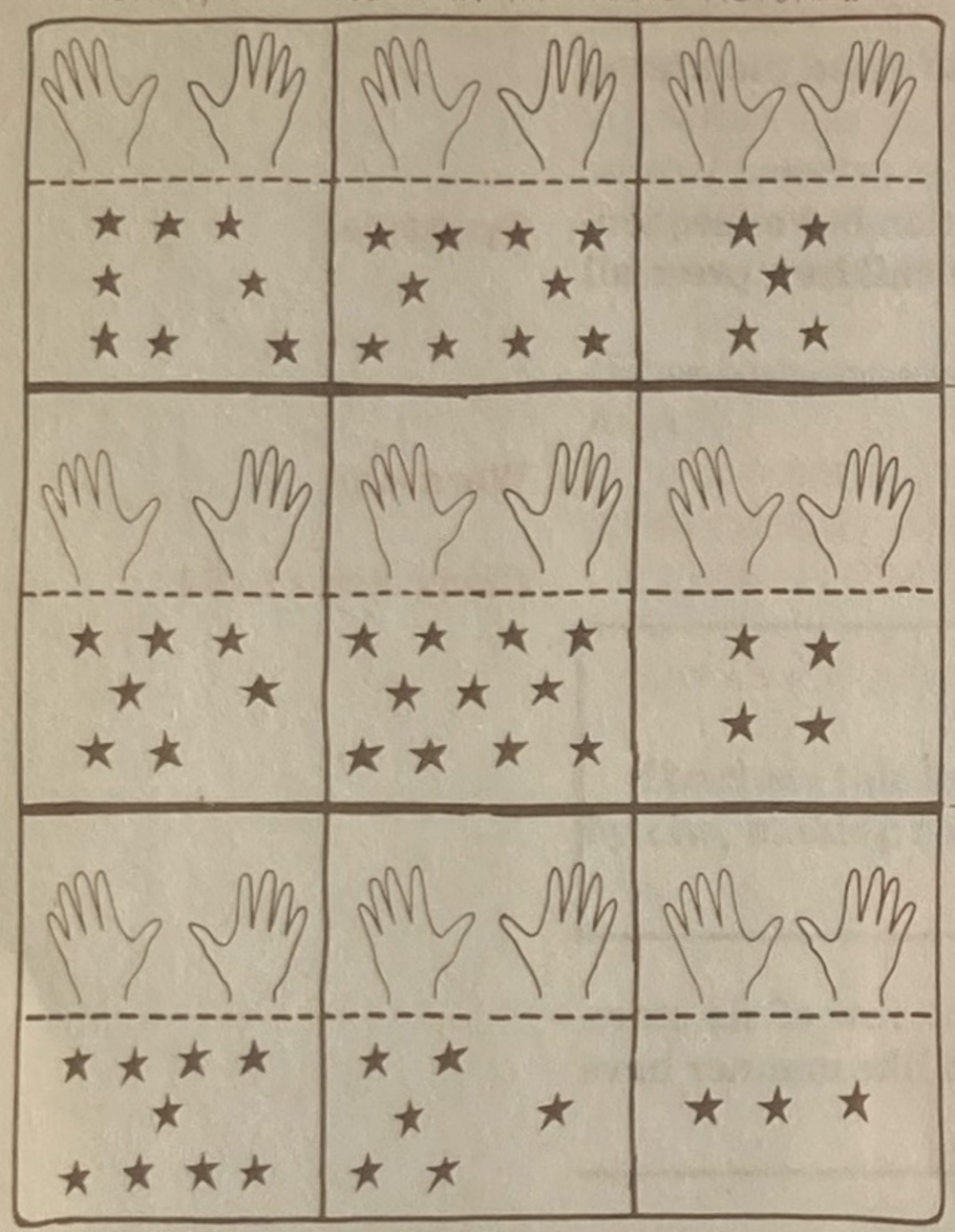


HOW MANY STARS ARE THERE INSIDE THE LOOP? Ten. THEN ONE BY ONE, PRESS TEN. One, two, three, four, five, six, seven, eight, nine, ten. GOOD. HOLD ON TO THE TEN. NOW TELL ME HOW MANY STARS THERE ARE OUTSIDE THE LOOP. One. WATCH NOW HOW I PRESS ONE MORE. I HAVE ALREADY PRESSED TEN ON MY LEFT HAND. Face board and press 10 on your left hand. NOW I PRESS ONE MORE ON MY RIGHT HAND LIKE THIS. Press 1 on your right hand. NOW YOU PRESS ONE MORE. One. SOMEONE TELL ME WHAT NUMBER COMES AFTER TEN. Eleven. GOOD. THAT'S THE NUMBER WE ARE ALL PRESSING. IT EVEN LOOKS LIKE ELEVEN! CLEAR YOUR FINGERS.

NOW WE ARE GOING TO COUNT BY ONES TO ELEVEN. READY? PRESS ELEVEN. One, two, three, four, five, six, seven, eight, nine, ten, eleven. DID EVERYONE END UP AS I DID? Demonstrate.

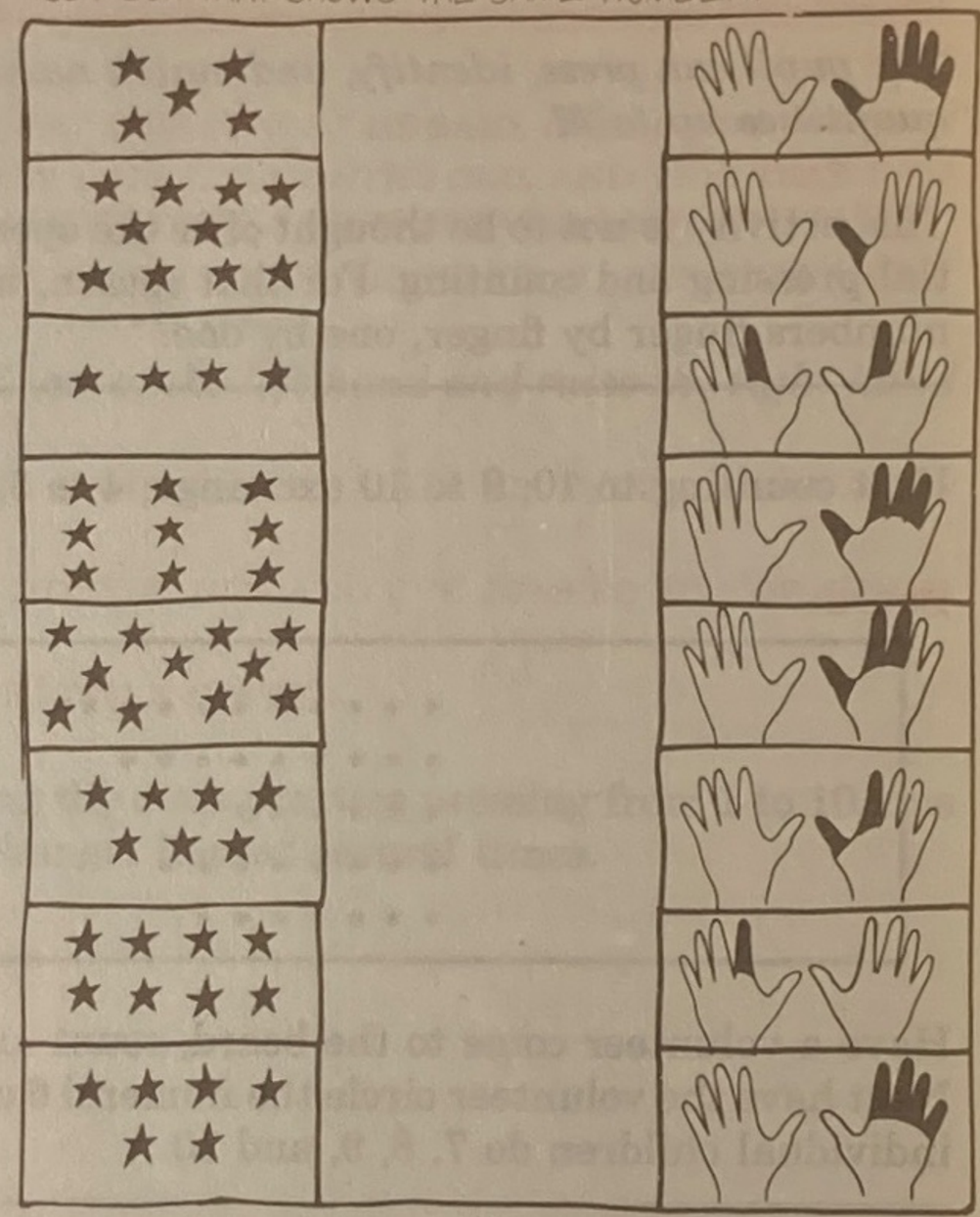
Repeat counting by 1s to 9, to 10, and to 11 before going to the pupils' books. Then turn to pages 67 and 68. Help the class to get started on each of the two activities.

COUNT THE NUMBER OF STARS, PRESS IT ON YOUR FINGERS, THEN COLOR IN THE HAND PICTURE..



67

DRAW A LINE FROM THE HAND PRESS PICTURE TO THE SET BOX THAT SHOWS THE SAME NUMBER.



68

Turn to pages 69 and 70. Help the class to get started on each activity. In all cases have them press the numbers shown.

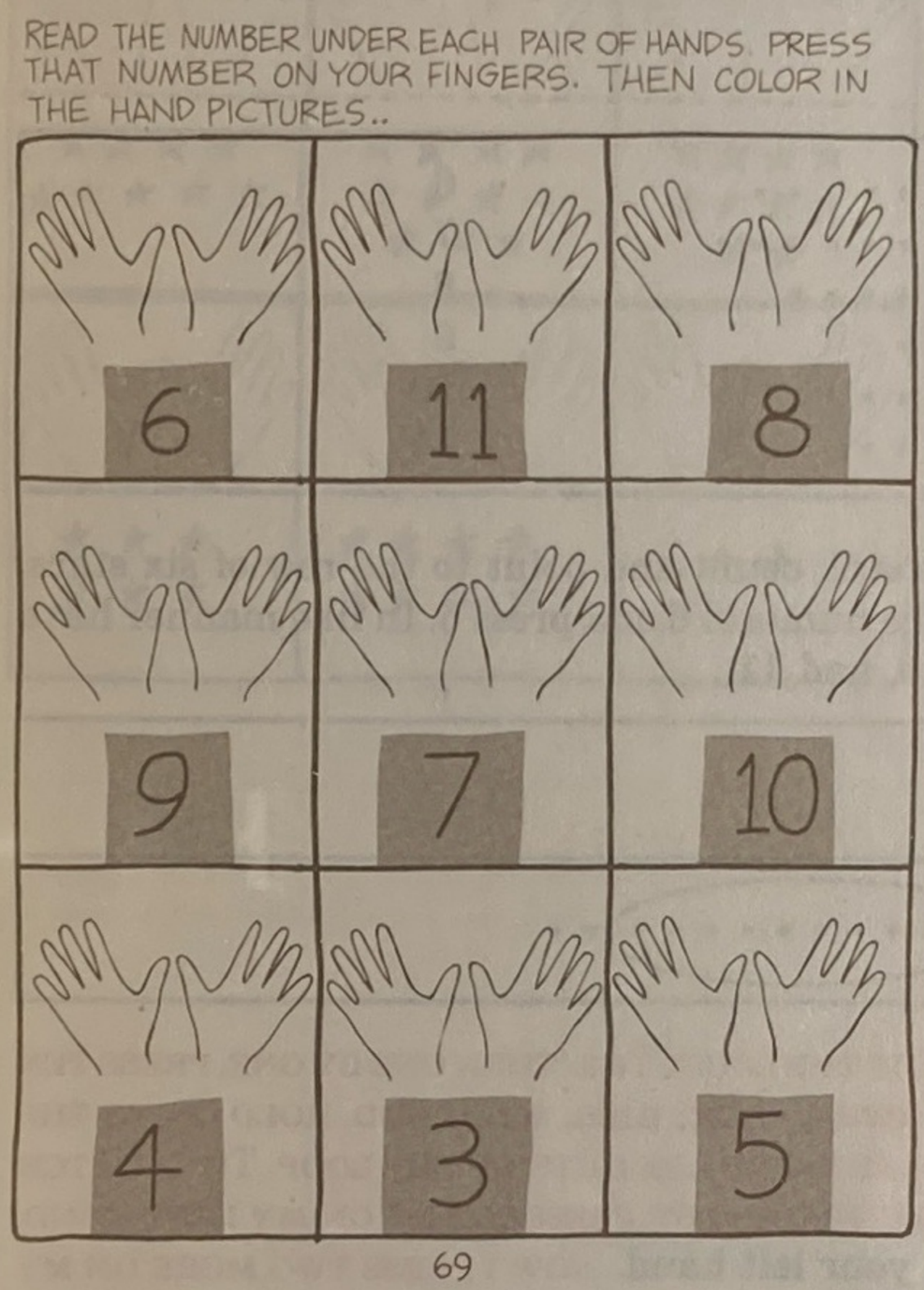
Book Activity 61B
(pages 69 and 70)

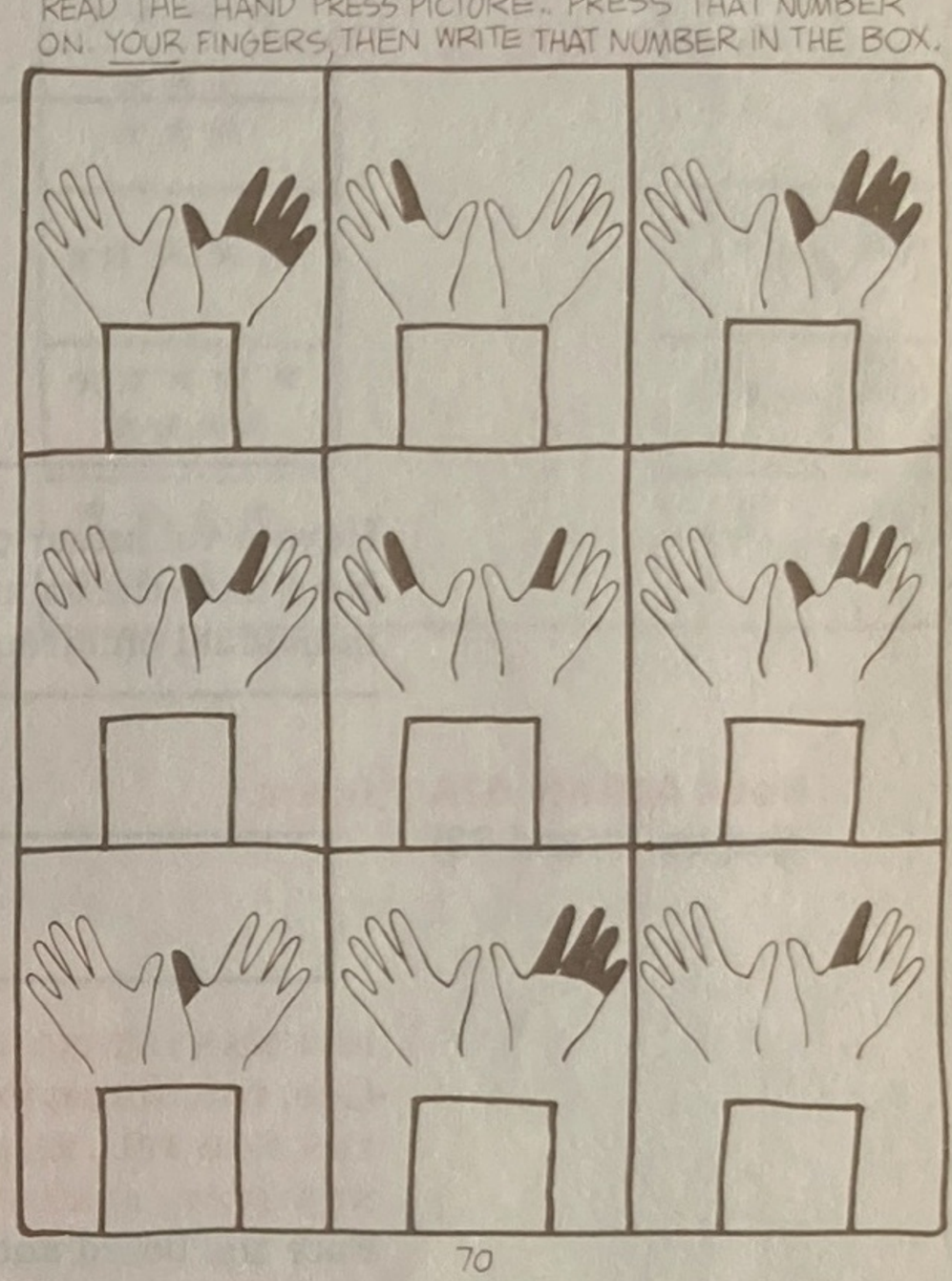
PRESS GAME

Game Activity 61

Materials: A set of large flash cards for the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.

This is a review activity. Go over each number several times, visually and orally, having the class press and clear all numbers presented in and out of sequence.





OBJECTIVE 62

The pupil can press, identify, and match numerals, sets, and hand pictures of quantities up to 12.

Synopsis Like the previous objective, this is not to be thought of as addition but as sequential pressing and counting. For that reason, insist that the children press all numbers finger by finger, one by one.

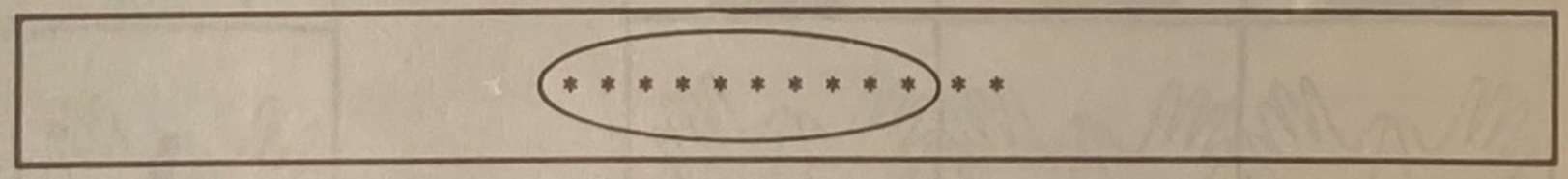
Warm-up Counting by 1s to 11; direct pressing to 11.

Class Activity 62 Board:

* * * * * * * * * * *	6
* * * * * * * * * * * *	7
* * * * * * * * * *	8
* * * * * *	9
* * * * * * * * *	10
* * * * * * * *	11

Have a volunteer come to the board, count and point to the row of six stars. Next have the volunteer circle the numeral 6 and press 6. In like manner have individual children do 7, 8, 9, 10, and 11.

Book Activity 62A (pages 71 and 72) Board:

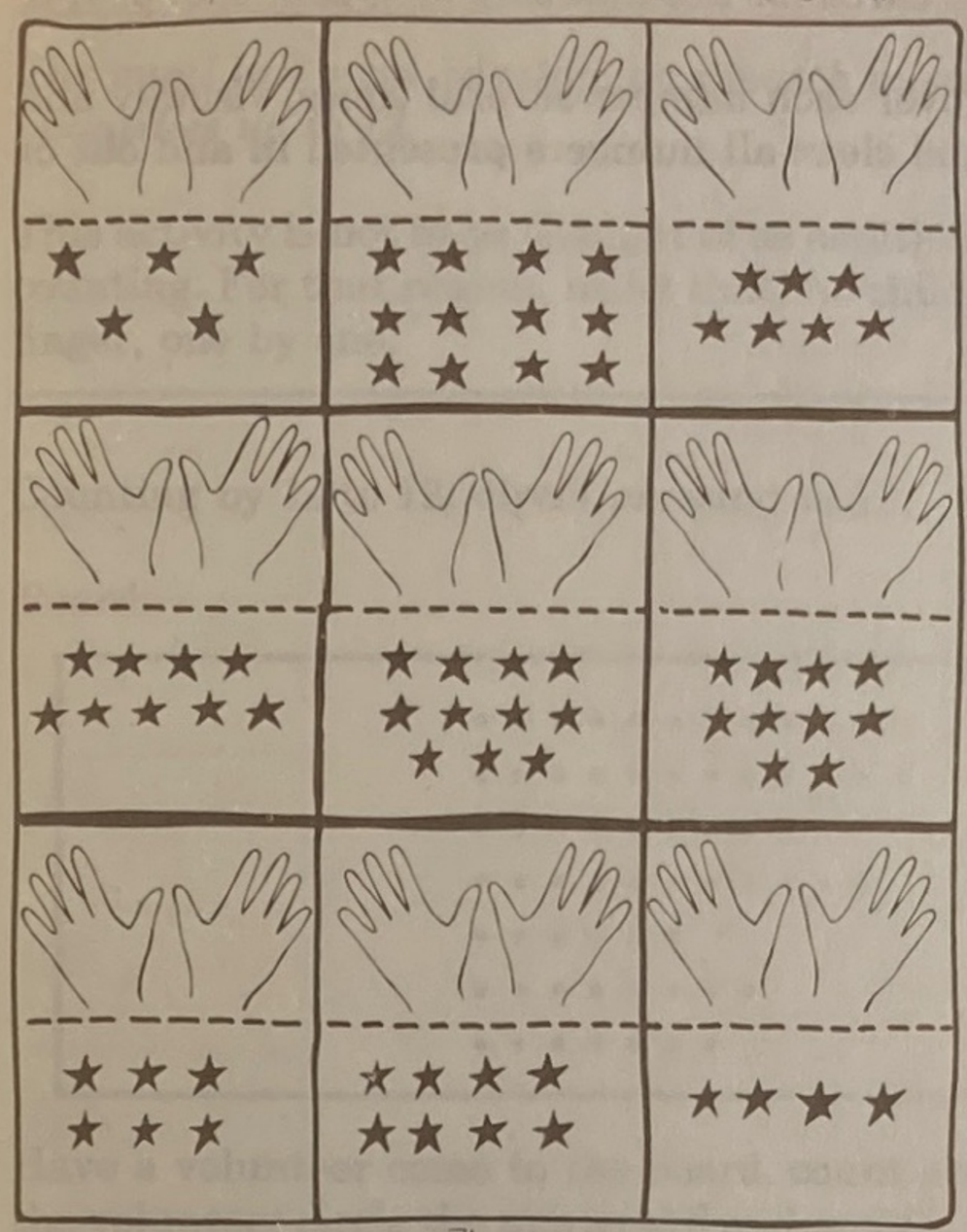


HOW MANY STARS ARE THERE INSIDE THE LOOP? Ten. THEN ONE BY ONE, PRESS TEN One, two, three, four, five, six, seven, eight, nine, ten. GOOD. HOLD ON TO THE TEN. NOW TELL ME HOW MANY STARS THERE ARE OUTSIDE THE LOOP. Two. WATCH NOW HOW I PRESS TWO MORE. I HAVE ALREADY PRESSED TEN ON MY LEFT HAND. Face the board and press 10 on your left hand. NOW I PRESS TWO MORE ON MY RIGHT HAND LIKE THIS. Press 2 on your right hand. NOW YOU PRESS TWO MORE. One, two. SOMEONE TELL ME WHAT NUMBER COMES AFTER ELEVEN. Twelve. GOOD. THAT'S THE NUMBER WE ARE ALL PRESSING. CLEAR YOUR FINGERS.

NOW WE ARE GOING TO COUNT BY ONES TO TWELVE. READY. PRESS TWELVE. One, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve. DID EVERYONE END UP AS I DID? Demonstrate.

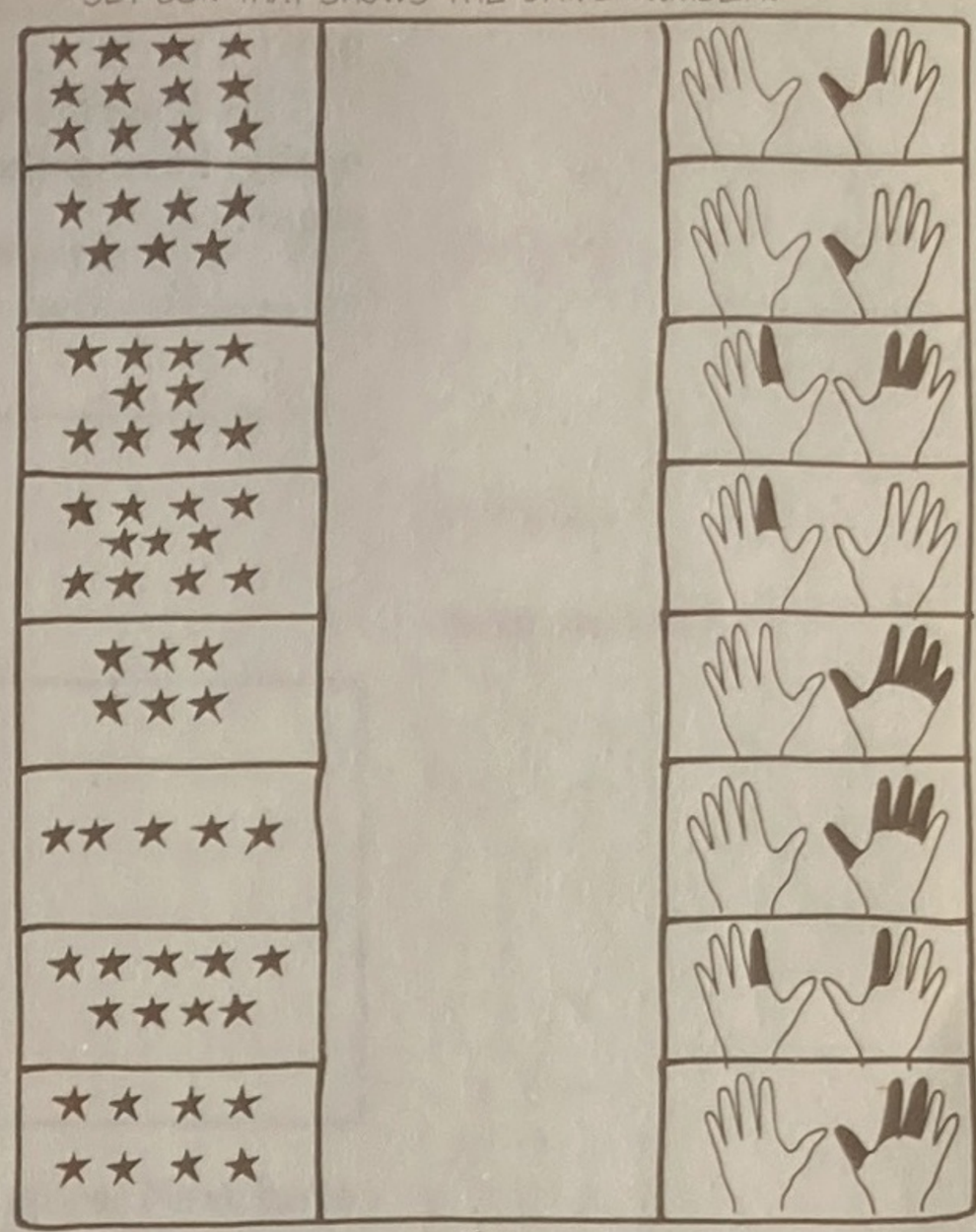
Repeat counting by 1s to 9, to 10, to 11, and to 12 before going to the pupils' books. Then turn to pages 71 and 72. Help the class to get started on each of the two activities.

COUNT THE NUMBER OF STARS, PRESS IT ON YOUR FINGERS, THEN COLOR IN THE HAND PICTURE..



71

DRAW A LINE FROM THE HAND PRESS PICTURE TO THE SET BOX THAT SHOWS THE SAME NUMBER.



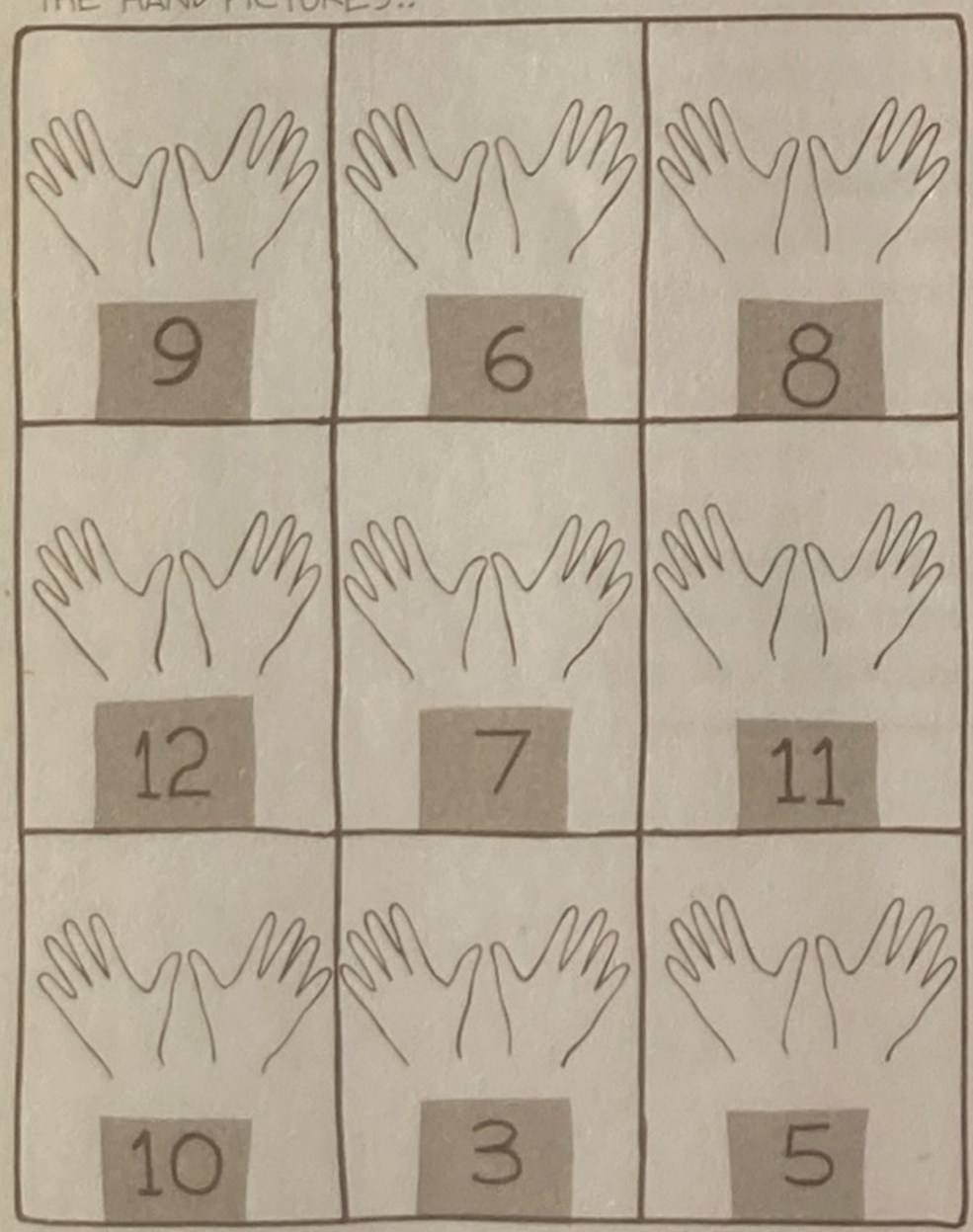
72

Game Activity 62 PRESS GAME

Materials: A set of large flash cards for the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.

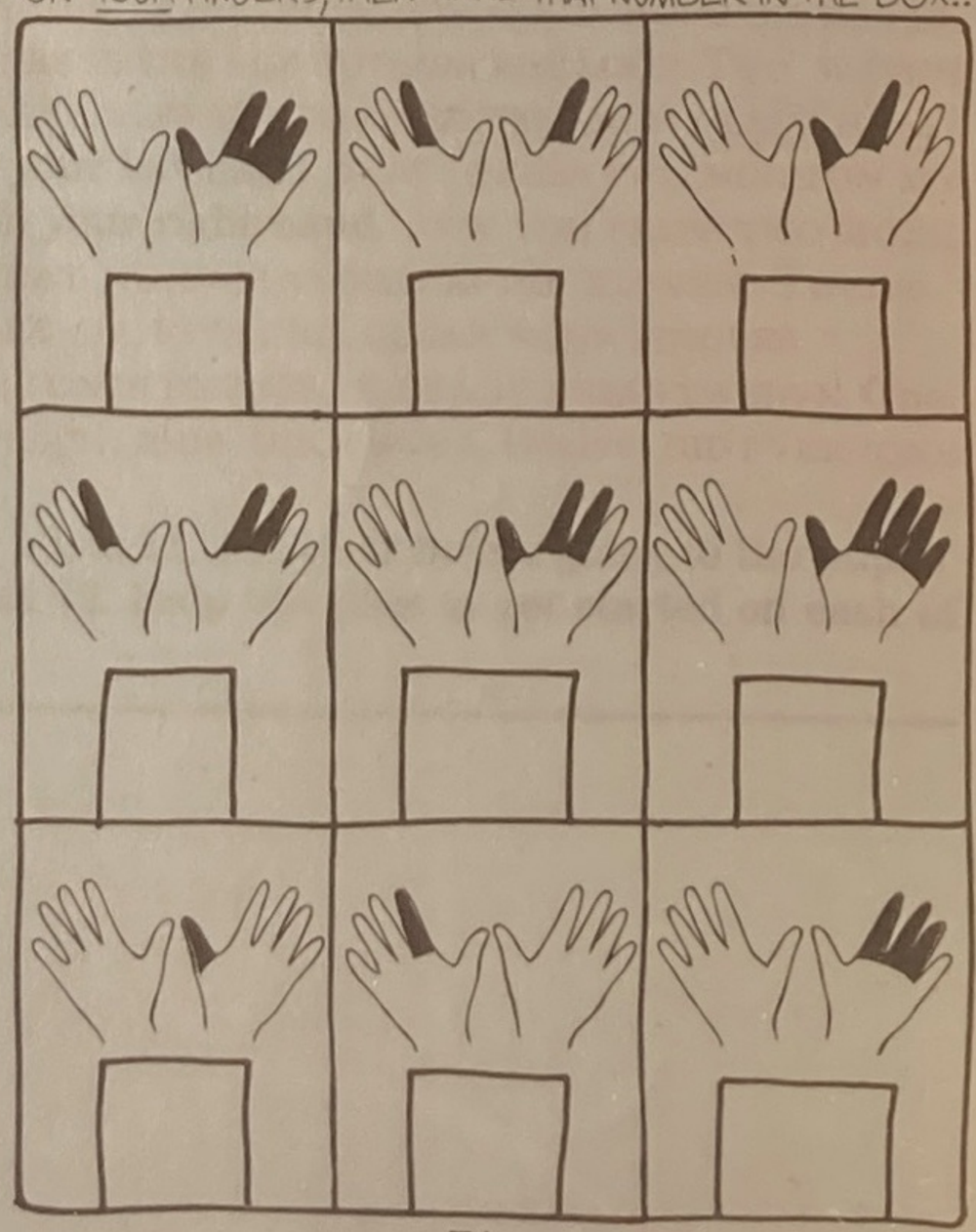
This is a review activity. Go over each number several times, visually and orally, having the class press and clear all numbers presented in and out of sequence.

READ THE NUMBER UNDER EACH PAIR OF HANDS. PRESS THAT NUMBER ON YOUR FINGERS. THEN COLOR IN THE HAND PICTURES..



73

READ THE HAND PRESS PICTURE.. PRESS THAT NUMBER ON YOUR FINGERS, THEN WRITE THAT NUMBER IN THE BOX..



74

OBJECTIVE 63

The pupil can press, identify, and match numerals, sets, and hand pictures of quantities up to 13.

Synopsis

This activity is not to be thought of as addition but as sequential pressing and counting. For that reason, insist that the children press all numbers finger by finger, one by one.

Warm-up

Counting by 1s to 12; direct pressing to 12.

Class Activity 63

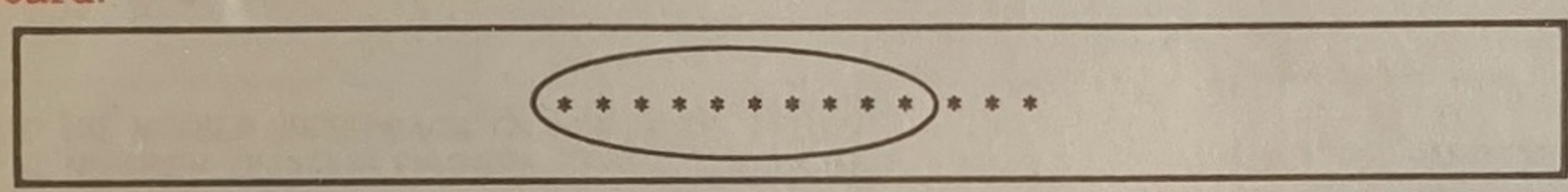
Board:

* * * * * * * * * * *	6
* * * * * * * * * * * * *	7
* * * * * * * * * *	8
* * * * * * * * * * * * *	9
* * * * * *	10
* * * * * * * * *	11
* * * * * * *	12

Have a volunteer come to the board, count and point to six stars. Next have the volunteer circle the numeral 6 and press 6. In like manner have individual children do 7, 8, 9, 10, 11, and 12.

Book Activity 63A
(pages 75 and 76)

Board:



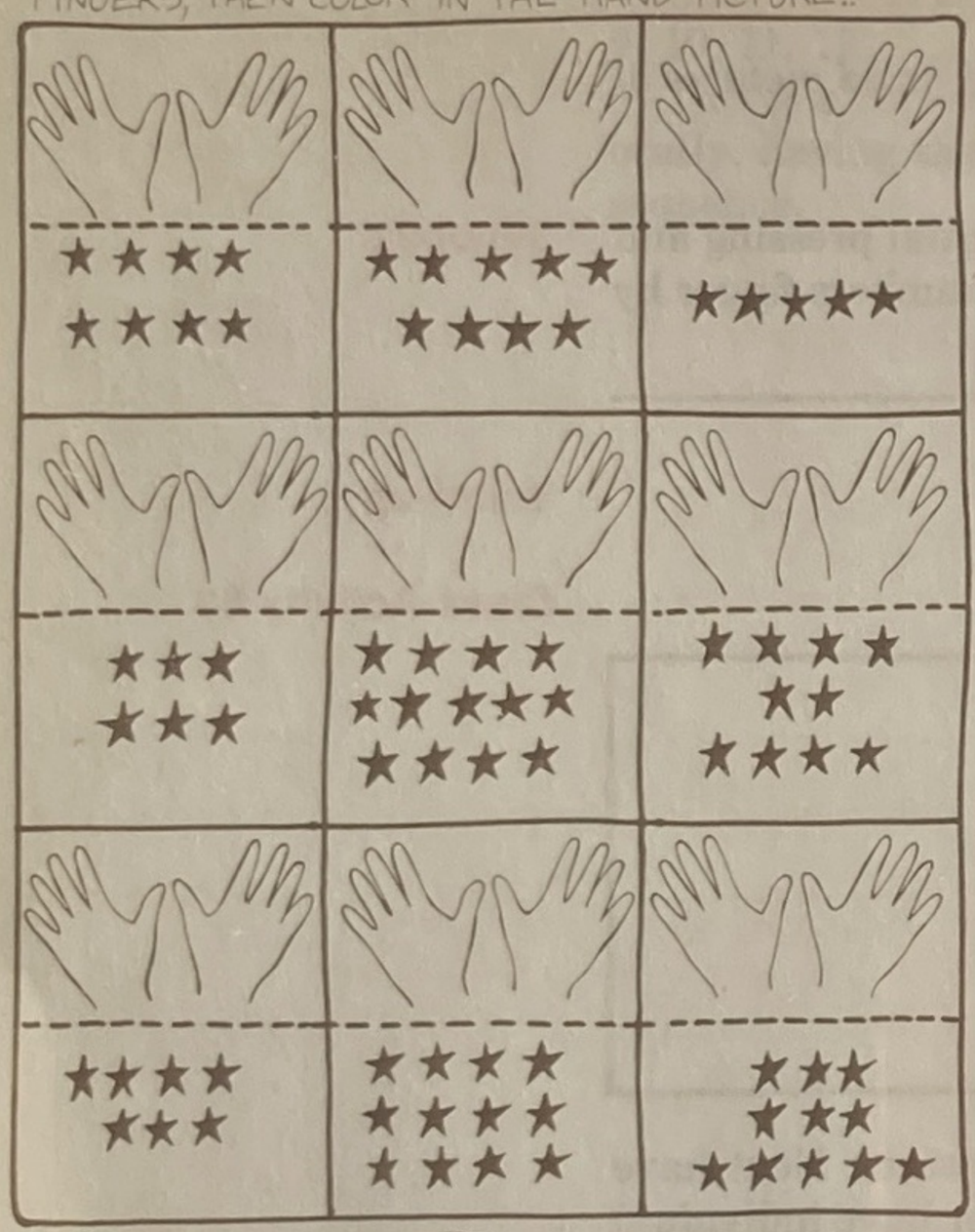
HOW MANY STARS ARE THERE INSIDE THE LOOP? Ten. THEN ONE BY ONE, PRESS TEN. One, two, three, four, five, six, seven, eight, nine, ten. GOOD. HOLD ON TO THE TEN. NOW TELL ME HOW MANY STARS THERE ARE OUTSIDE THE LOOP. Three. WATCH NOW HOW I PRESS THREE MORE. I HAVE ALREADY PRESSED TEN ON MY LEFT HAND. Face the board and press 10 on your left hand. NOW I PRESS THREE MORE ON MY RIGHT HAND LIKE THIS. Press 3 on your right hand, one by one.

NOW YOU PRESS THREE MORE. One, two, three. SOMEONE TELL ME WHAT NUMBER COMES AFTER TWELVE. Thirteen. GOOD. THAT'S THE NUMBER WE ARE ALL PRESSING. CLEAR YOUR FINGERS.

NOW WE ARE GOING TO COUNT BY ONES TO THIRTEEN. READY. PRESS THIRTEEN. One, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen. DID EVERYONE END UP AS I DID? Demonstrate.

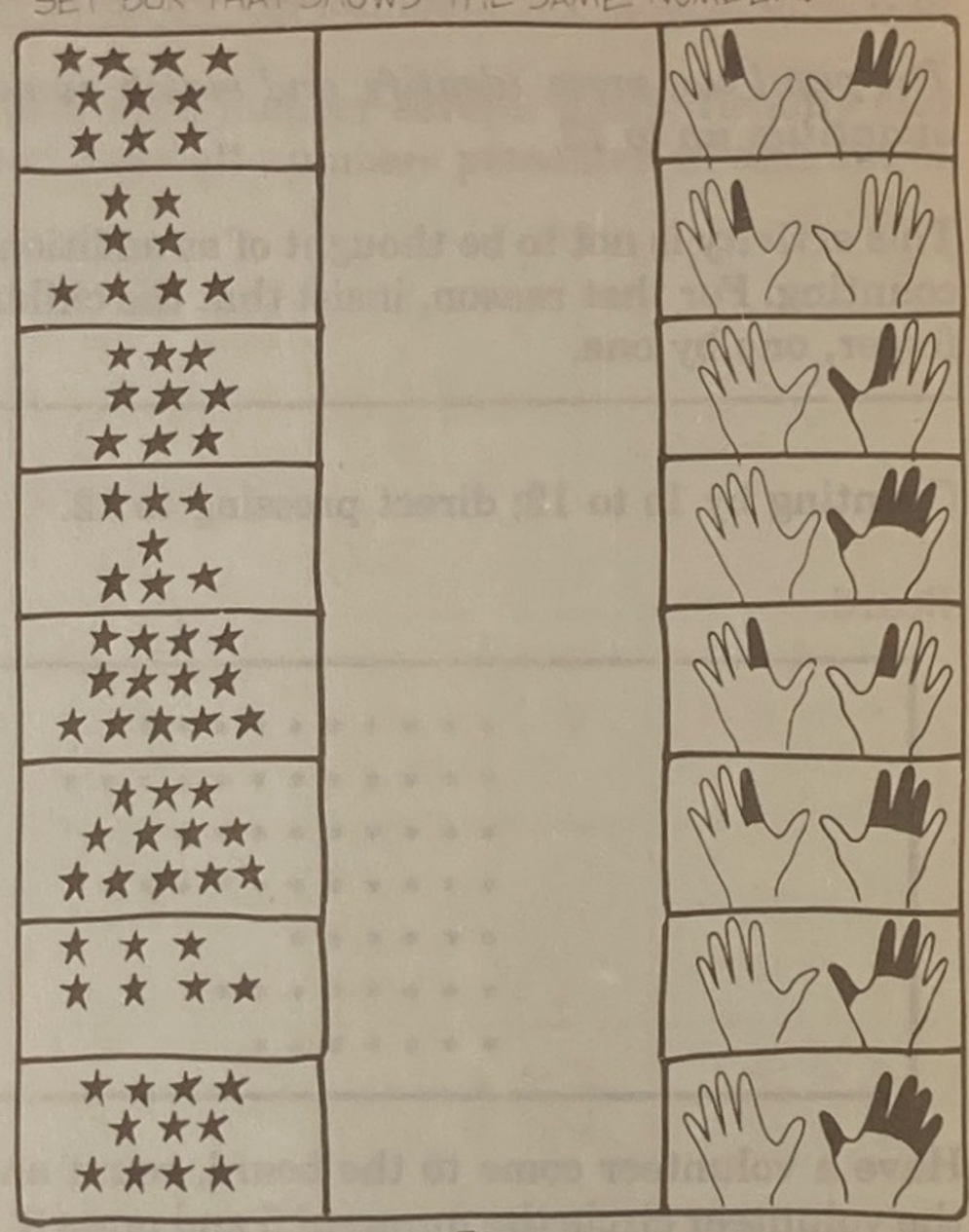
Repeat counting by 1s to 9, to 10, to 11, to 12, and to 13 before you go to the pupils' books. Then turn to pages 75 and 76. Help the class to get started on each of the two activities.

COUNT THE NUMBER OF STARS, PRESS IT ON YOUR FINGERS, THEN COLOR IN THE HAND PICTURE..



75

DRAW A LINE FROM THE HAND PRESS PICTURE TO THE SET BOX THAT SHOWS THE SAME NUMBER.



76

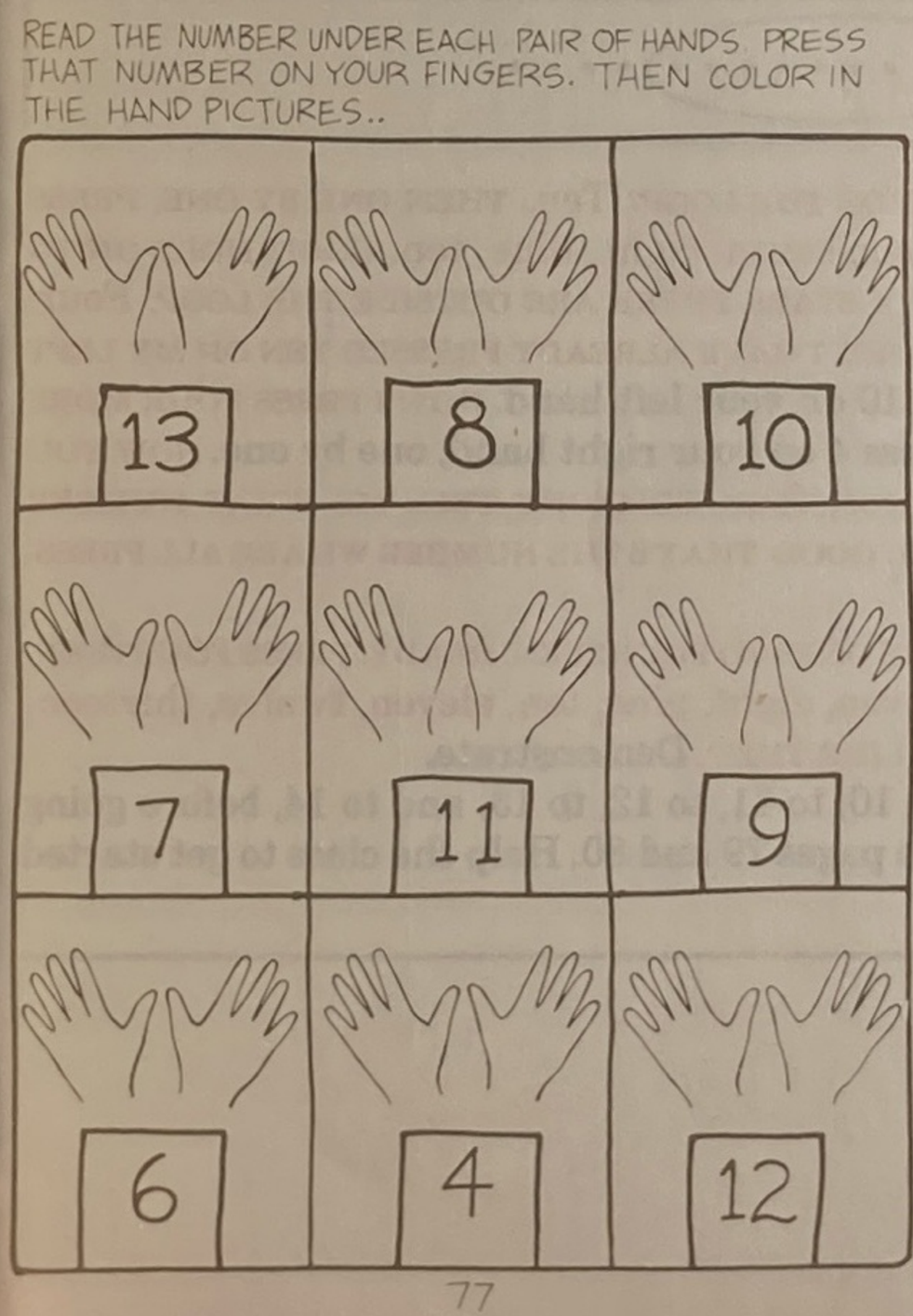
Turn to pages 77 and 78. Help the class to get started on each activity. In all cases have them press the numbers shown.

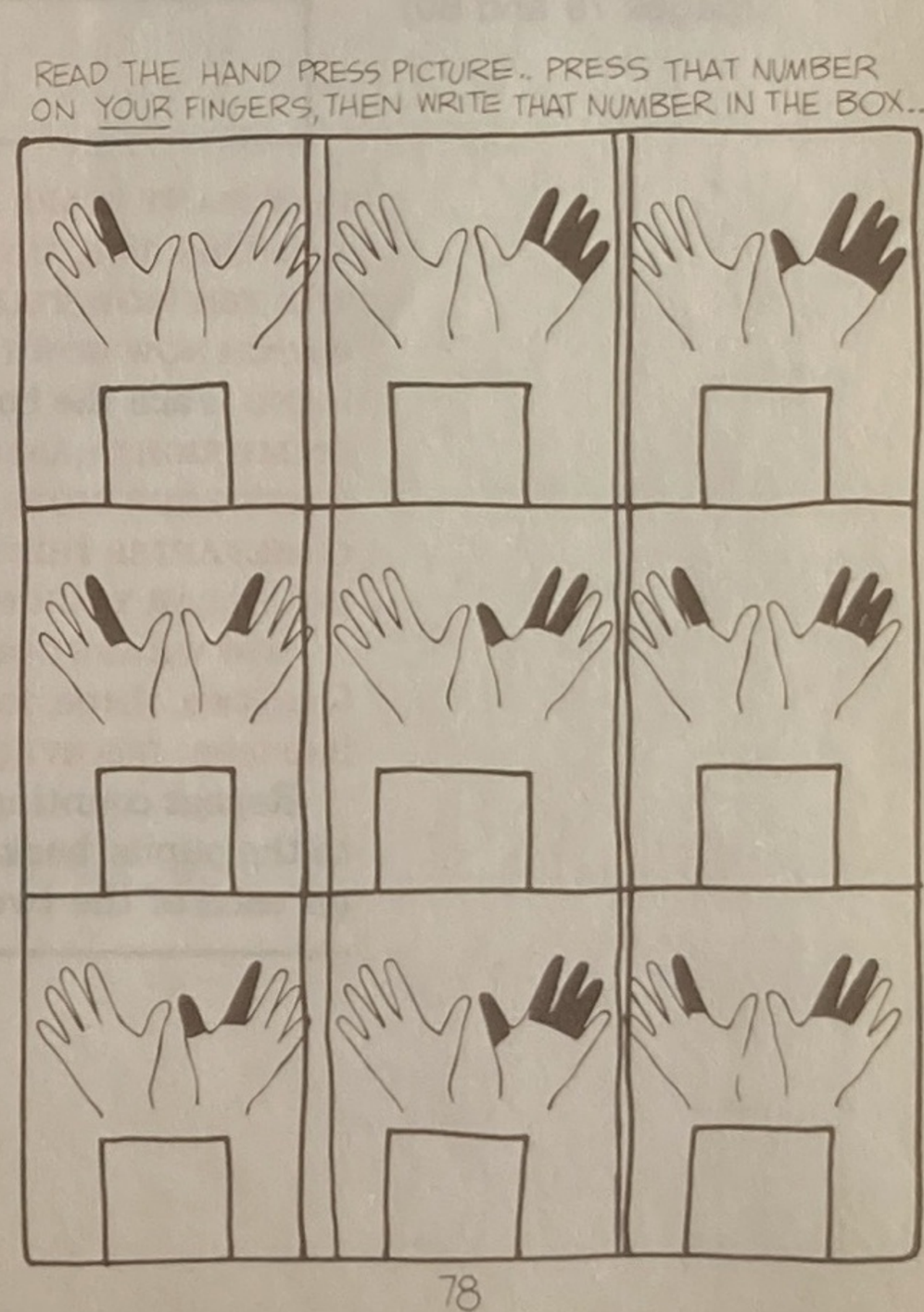
Book Activity 63B
(pages 77 and 78)

PRESS GAME

Game Activity 63

Materials: A set of large flash cards for the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13. Go over each number several times, visually and orally, having the class press all numbers presented in and out of sequence.





OBJECTIVE 64

The pupil can press, identify, and match numerals, sets, and hand pictures of quantities up to 14.

Synopsis This activity is not to be thought of as addition but as sequential pressing and counting. For that reason, insist that the children press all numbers finger by finger, one by one.

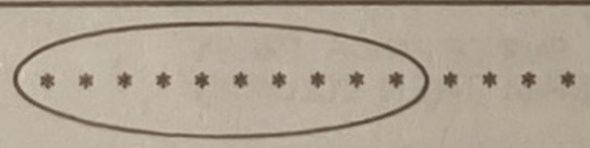
Warm-up Counting by 1s to 13; direct pressing to 13.

Class Activity 64 Board:

* * * * * * * * * *	6
* * * * * * * * * * *	7
* * * * * * * * * * * *	8
* * * * * *	9
* * * * * * * * *	10
* * * * * * * *	11
* * * * * * * * * * * * *	12
* * * * * * *	13

Have a volunteer come to the board, count and point to six stars. Next have the volunteer circle the numeral 6 and press 6. In like manner have individual children do 7, 8, 9, 10, 11, 12, and 13.

Book Activity 64A (pages 79 and 80) Board:

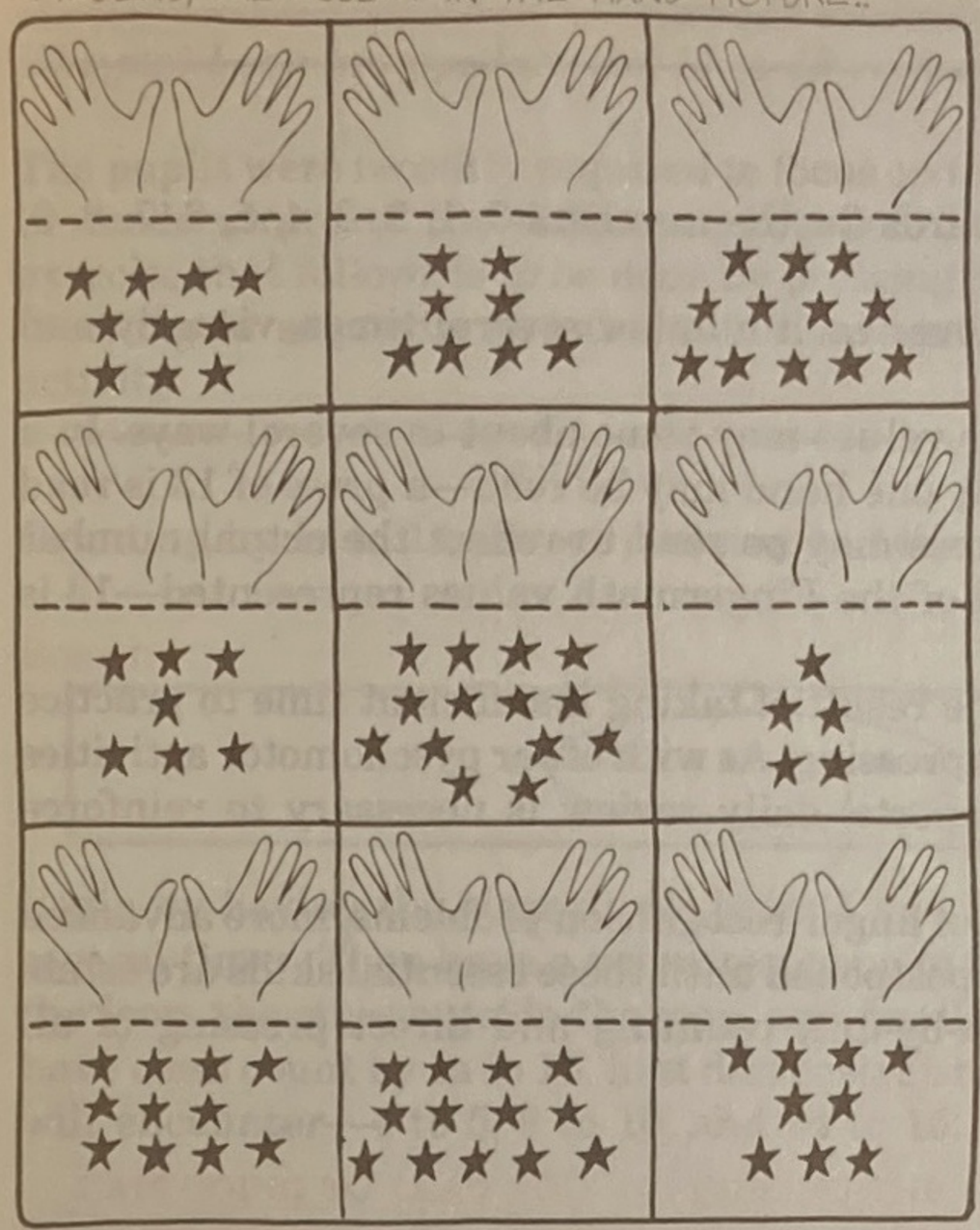


HOW MANY STARS ARE THERE INSIDE THE LOOP? Ten. THEN ONE BY ONE, PRESS TEN. One, two, three, four, five, six, seven, eight, nine, ten. GOOD. HOLD ON TO THE TEN. NOW TELL ME HOW MANY STARS THERE ARE OUTSIDE THE LOOP. Four. WATCH NOW HOW I PRESS FOUR MORE. I HAVE ALREADY PRESSED TEN ON MY LEFT HAND. Face the board and press 10 on your left hand. NOW I PRESS FOUR MORE ON MY RIGHT HAND LIKE THIS. Press 4 on your right hand, one by one. NOW YOU PRESS FOUR MORE. One, two, three, four. SOMEONE TELL ME WHAT NUMBER COMES AFTER THIRTEEN. Fourteen. GOOD. THAT'S THE NUMBER WE ARE ALL PRESSING. CLEAR YOUR FINGERS.

NOW WE ARE GOING TO COUNT BY ONES TO FOURTEEN. READY. PRESS FOURTEEN. One, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen, fourteen. DID EVERYONE END UP LIKE THIS? Demonstrate.

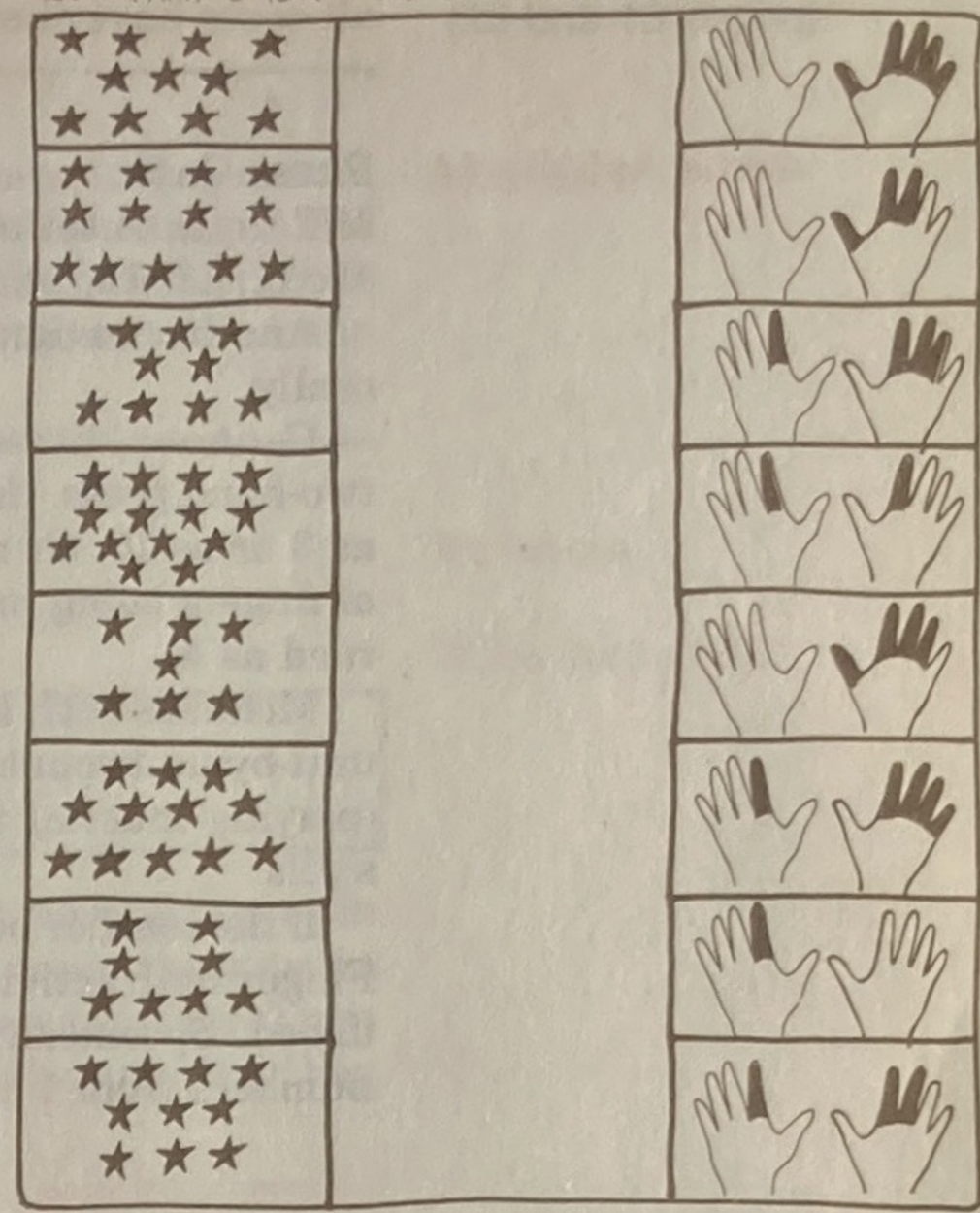
Repeat counting by 1s to 9, to 10, to 11, to 12, to 13, and to 14, before going to the pupils' books. Then turn to pages 79 and 80. Help the class to get started on each of the two activities.

COUNT THE NUMBER OF STARS, PRESS IT ON YOUR FINGERS, THEN COLOR IN THE HAND PICTURE..



79

DRAW A LINE FROM THE HAND PRESS PICTURE TO THE SET BOX THAT SHOWS THE SAME NUMBER.



80

Book Activity 64B (pages 81 and 82)

Turn to pages 81 and 82. Help the class to get started on each activity. In all cases have them press the numbers shown.

Game Activity 64

PRESS GAME

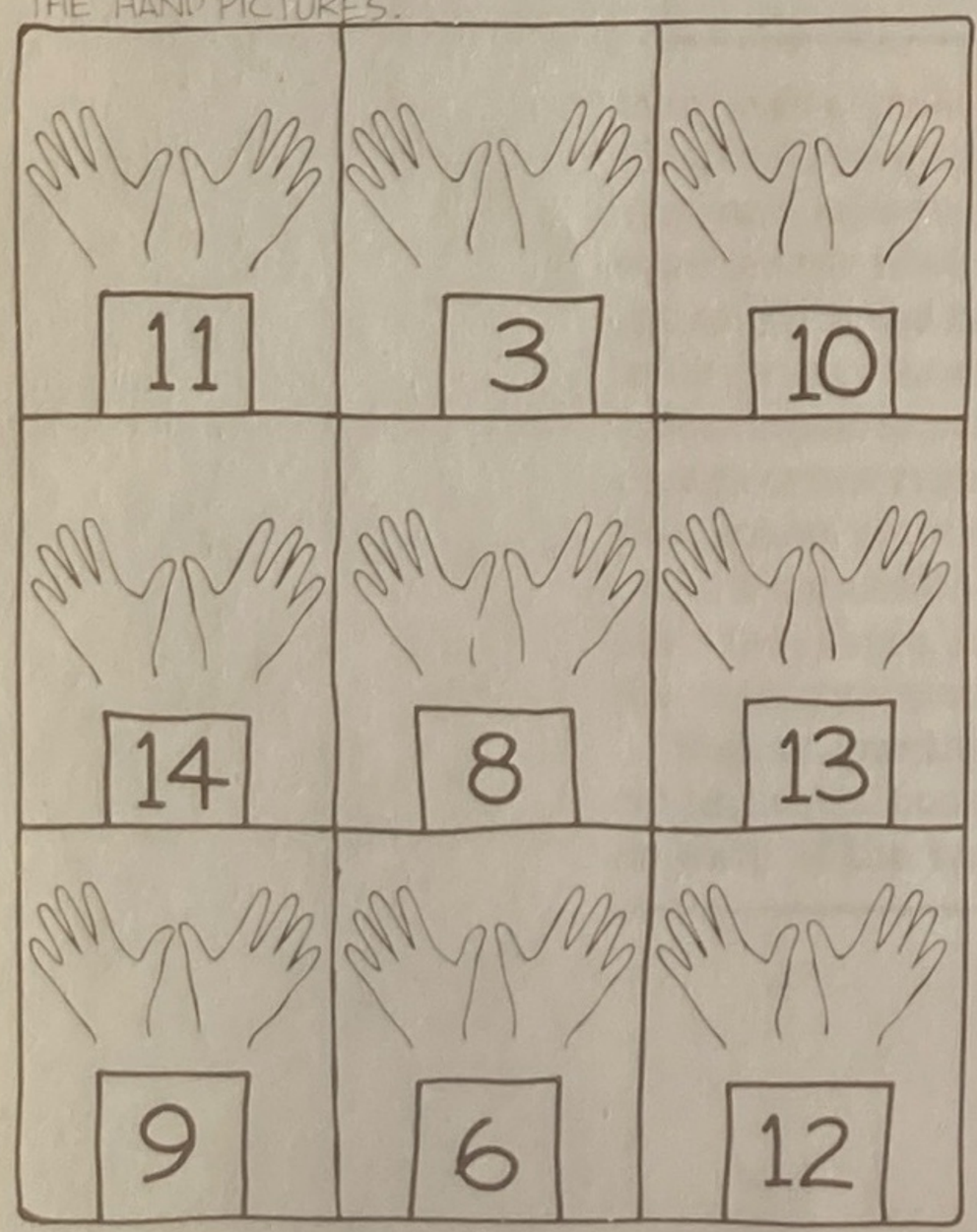
Materials: A set of large flash cards for the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14.

Another review activity. Go over each number several times, visually and orally.

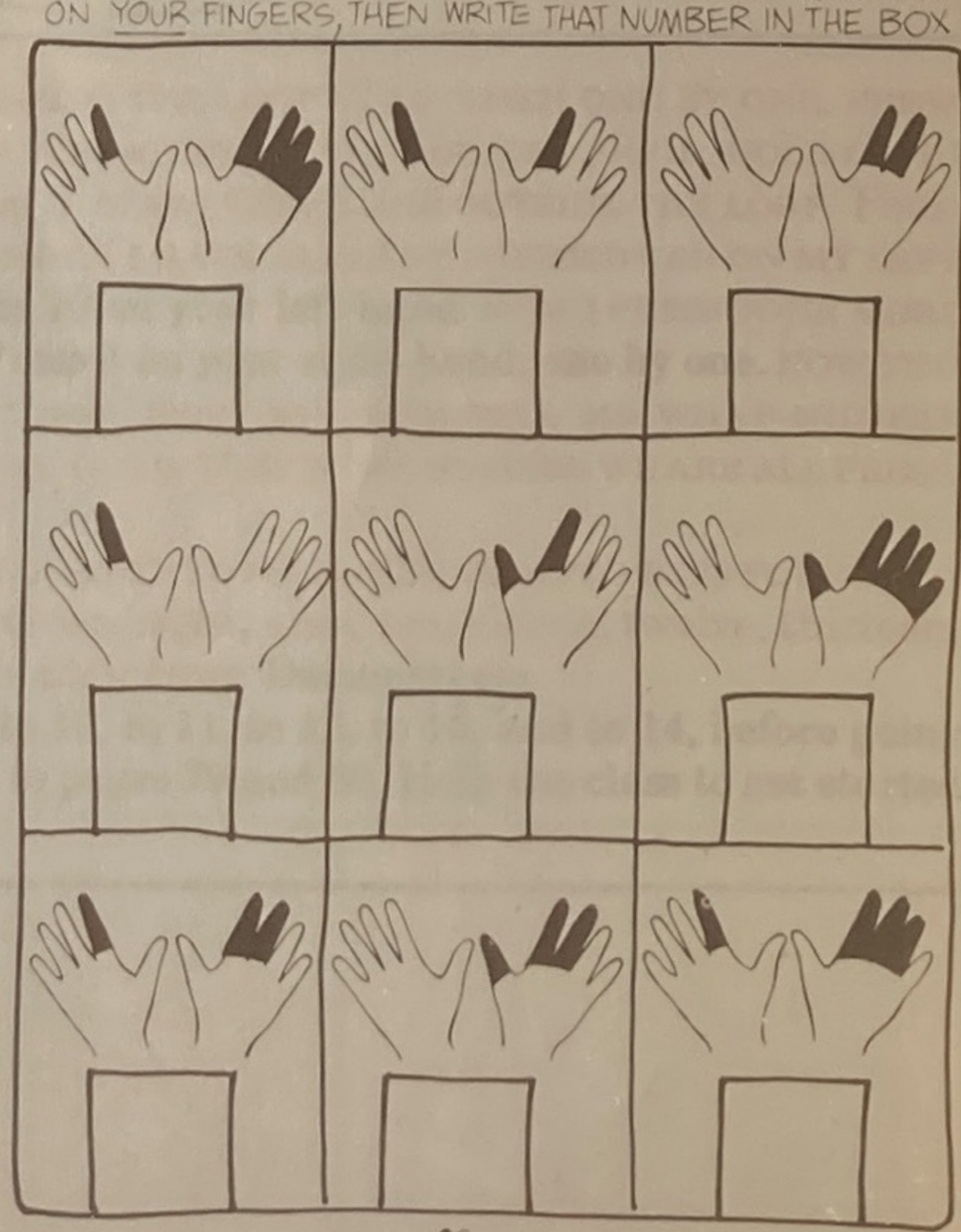
Caution: Misreading of finger values may come about in several ways. In a two-hand press, the value of only one hand may be read—a press of 13 is read as 3 or as 10. Or a two-hand press may be read to reflect the actual number of fingers being pressed instead of the Fingermath values represented—13 is read as 4.

Mistakes such as these are the result of taking insufficient time to practice unit-by-unit counting and direct pressing. As with other pyschomotor activities (playing musical instruments, sports) daily review is necessary to reinforce skills.

If the teacher becomes aware of finger-recognition problems, more advanced Fingermath activities should be postponed until these essential skills are established. Specifically, review unit-by-unit counting and direct pressing of all numbers from 1 to 14.



81



82

OBJECTIVE 65

The pupil can manipulate the 14 to 15 exchange.

Synopsis

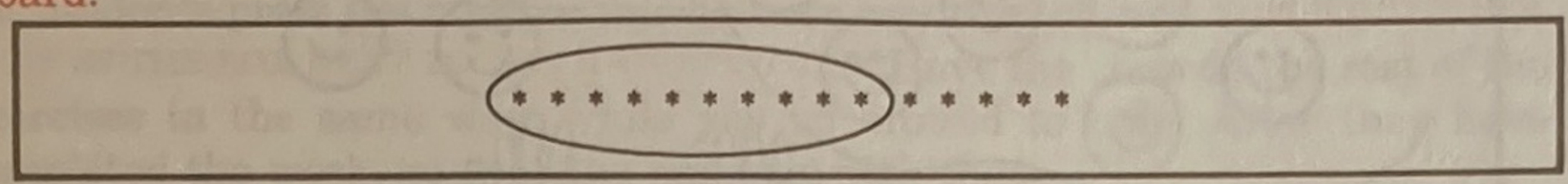
The pupils were recently required to focus on the 9 to 10 exchange. They should be made aware of the difference between it and the 4 to 5 exchange. The exercise that follows is to be done by pressing by 1s, so that the pupils practice counting in sequence and therewith encounter both exchanges in the same activity.

Warm-up

Counting by 1s to 14; direct pressing to 14

Class Activity 65

Board:



Begin by having the class direct press 5 and 10 alternately, verbalizing each several times. Then have a volunteer come to the board and count the stars in the loop, the stars outside the loop, and finally all of the stars together. Then have class count by 1s to 15, first demonstrating the three exchanges that they will encounter—4 to 5, 9 to 10, and 14 to 15.

I AM GOING TO LEAD YOU IN PRESSING THE NUMBERS FROM ONE TO FIFTEEN. THAT MEANS WE WILL USE THE FLIPPER FOR THE 4 TO 5 EXCHANGE, THE HOPPER FOR THE 9 TO 10 EXCHANGE, AND THE FLIPPER AGAIN FOR THE 14 TO 15 EXCHANGE. WATCH ME DO IT FIRST. Demonstrate, adding verbal emphasis each time an exchange is made.

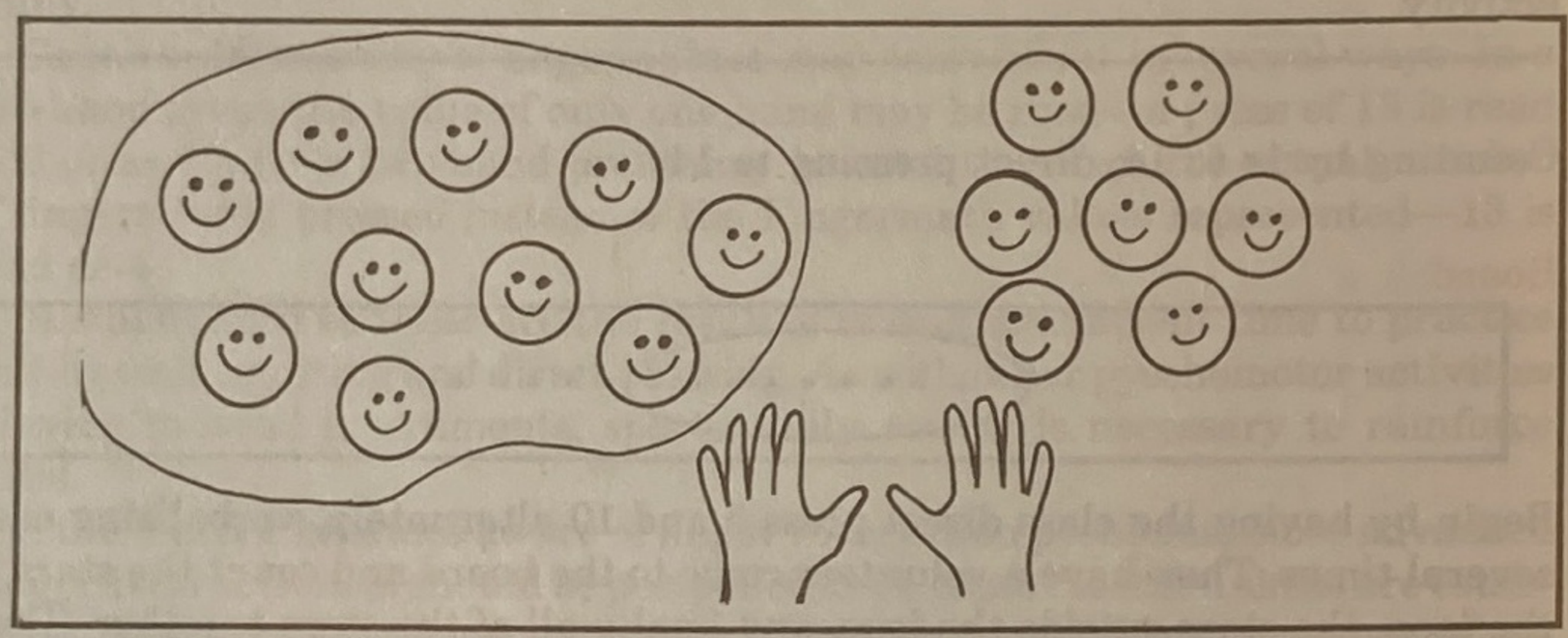
EVERYONE, NOW. FINGERS READY. LET'S PRESS AND COUNT TO FIFTEEN TOGETHER. ONE, TWO, THREE, FOUR, *FIVE,* SIX, SEVEN, EIGHT, NINE, *TEN,* ELEVEN, TWELVE, THIRTEEN, FOURTEEN, *FIFTEEN.* WHICH FINGERS ARE PRESSED ON EACH HAND? The index finger on the left hand and the thumb on the right hand. This activity should be done with special care. Children sometimes get confused deciding on which hand to make the 14 to 15 exchange. It is therefore advisable the first few times to stop the class in their count at 14 and ask them how they will make the 14 to 15 exchange. Then ask different children to come to the front and lead the class in pressing the numbers 10 through 15 by ones, going through the entire sequence two or three times in random order, stressing 15 more frequently than the other numbers.

OBJECTIVE 66

The pupil can compare sets of ten to nineteen objects to hand pictures and can press these values.

Warm-up Pressing and counting by units to 15; direct pressing numbers to 15.

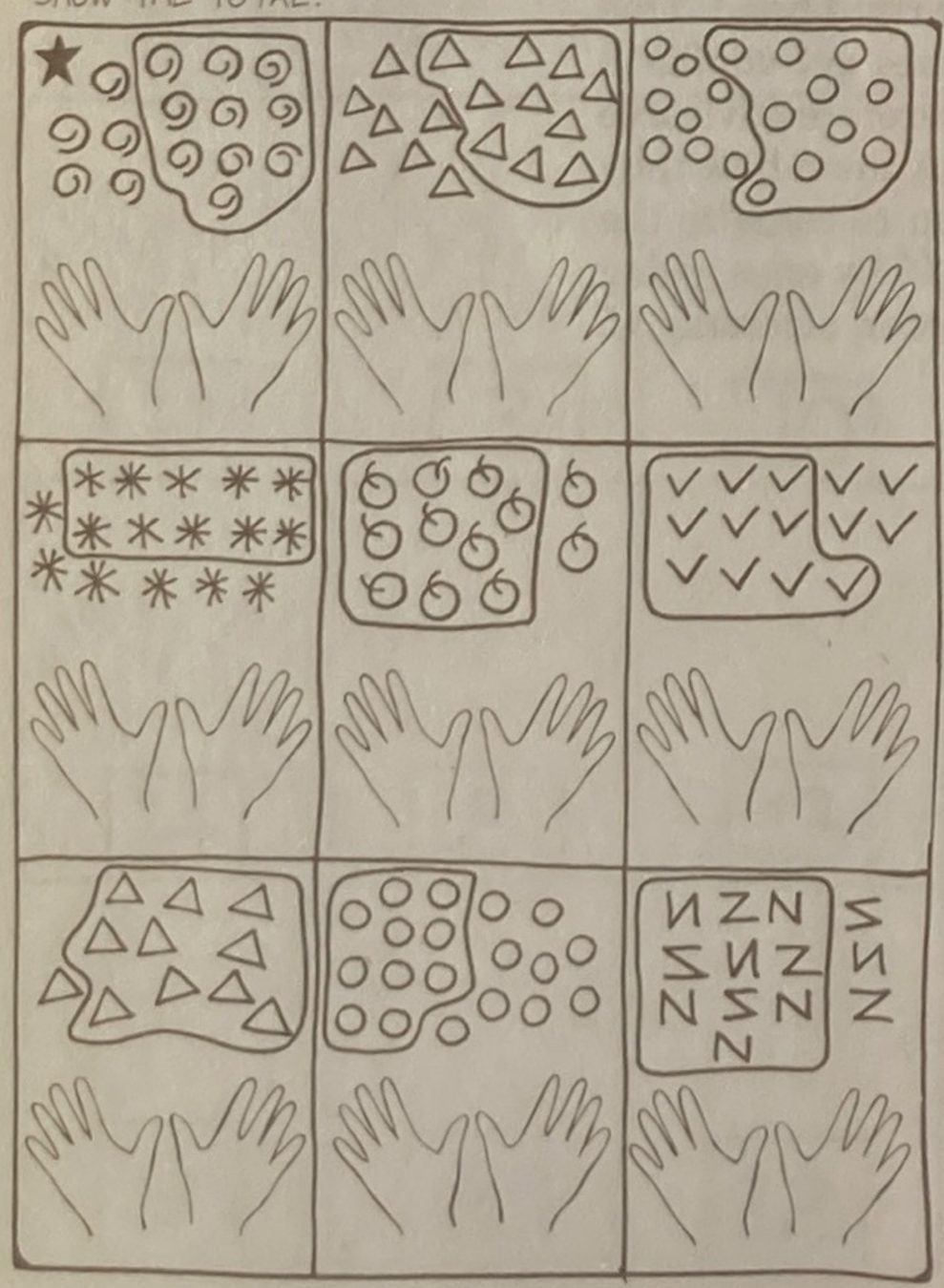
Book Activity 66 (page 83) Board:



Demonstrate at the board, counting the number of happy faces as ten and seven more. Then fill in the hand pictures under the happy faces.

Ask the class to turn to page 83. For each of the examples, ask a different pupil to lead the class in going through the same activity as the board volunteer does at the board, pressing and verbalizing by 10s and 1s and coloring in the correct hand press.

ADD UP THE COUNTERS AND SAY THEM AS "TEN" AND SO MANY MORE. COLOR THE HANDS TO SHOW THE TOTAL.



83

OBJECTIVE 67

The pupil can press, read, and match fingerpress positions 10 through 19 with hand pictures and numerals.

Synopsis

These activities link the fingerpress hand pictures to the written numeral. In so doing, the meaning of place value is reinforced.

Warm-up

Unit pressing to 15; direct pressing to 15; all exchanges.

Book Activity 67A
(page 84)

OPEN YOUR BOOKS TO PAGE 84. LOOK AT THE FIRST FINGERPRESS HAND PICTURE. WHAT NUMBER IS REPRESENTED BY THE PICTURE? Nineteen. PRESS NINETEEN. Let the students press the number in whatever way they choose. NOW WRITE NINETEEN IN THE BOX NEXT TO THE HAND PICTURE. Have the class do the rest of the exercises in the same way, while you go around to help. After they have completed the work, go over the answers with them.

Book Activity 67B
(page 85)

OPEN YOUR BOOKS TO PAGE 85. LOOK AT THE FIRST BOX. WHAT NUMBER IS WRITTEN IN THE BOX? Sixteen. PRESS SIXTEEN. Let the pupils press the number in whatever way they choose. NOW COLOR IN THE FINGERPRESS HANDS SO THAT THEY SHOW SIXTEEN. Have the class do the rest of the exercises in the same way, while you go around to help. After they have completed the work, go over the answers with them.

Game Activity 67

SILENT TRADING GAME (optional for mature pupils)

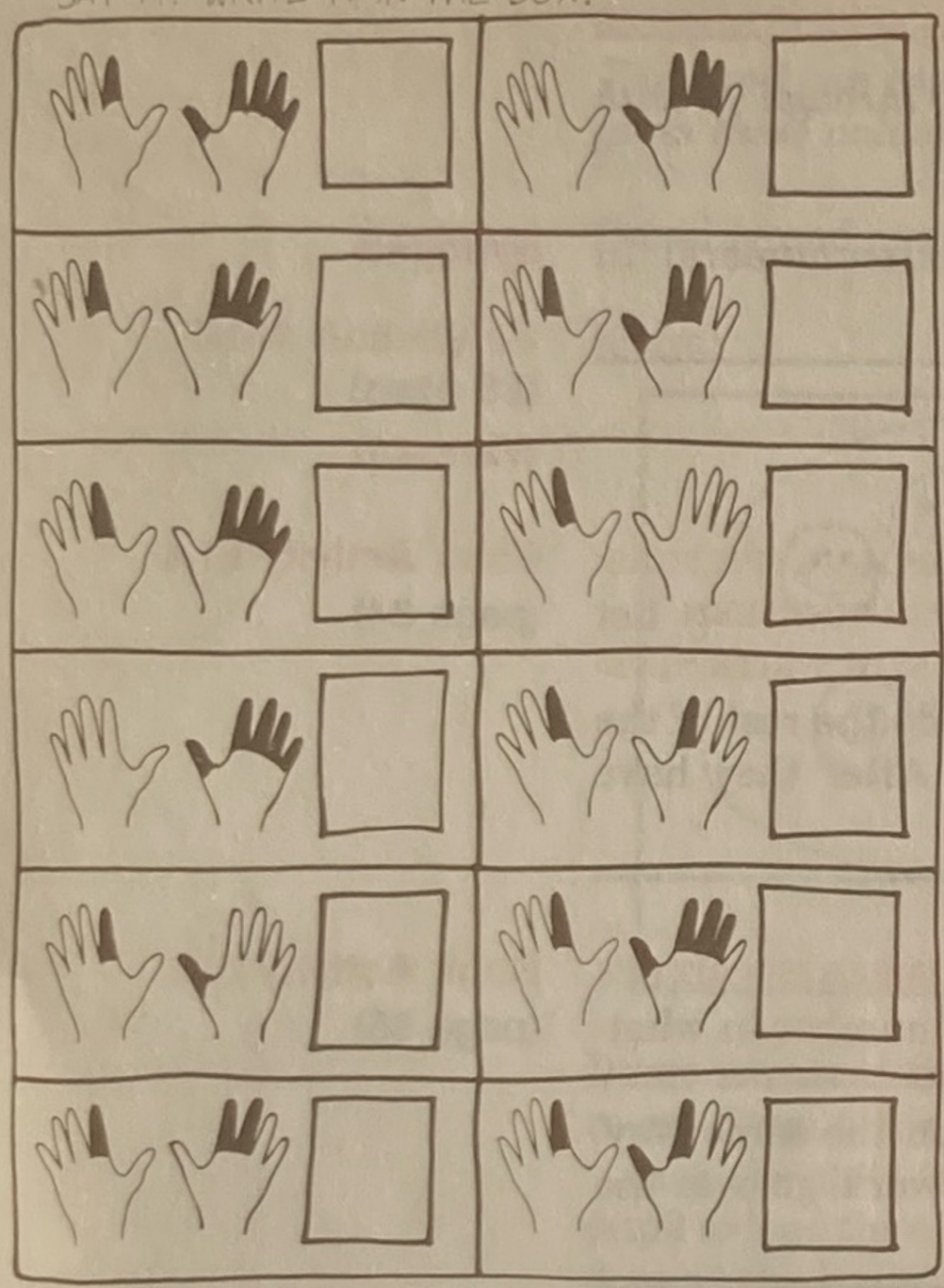
Materials: Each *buyer* gets $1.45 in play money consisting of eleven dimes, six nickels, and five pennies. Pennies, nickels, and dimes are preferable to dollars, since coins are more familiar to the children's personal experience. Each *seller* gets number cards 10 through 19.

The object of the game is for the pupil holding the money, the buyer, to purchase all the number cards from the seller at face value.

Half the pupils act as buyers and get money as indicated above, while the other half act as sellers and get number cards. The entire game is to be played in silence. In particular, the amount on the number cards is not to be spoken or shown but must be communicated only by fingerpressing and reading.

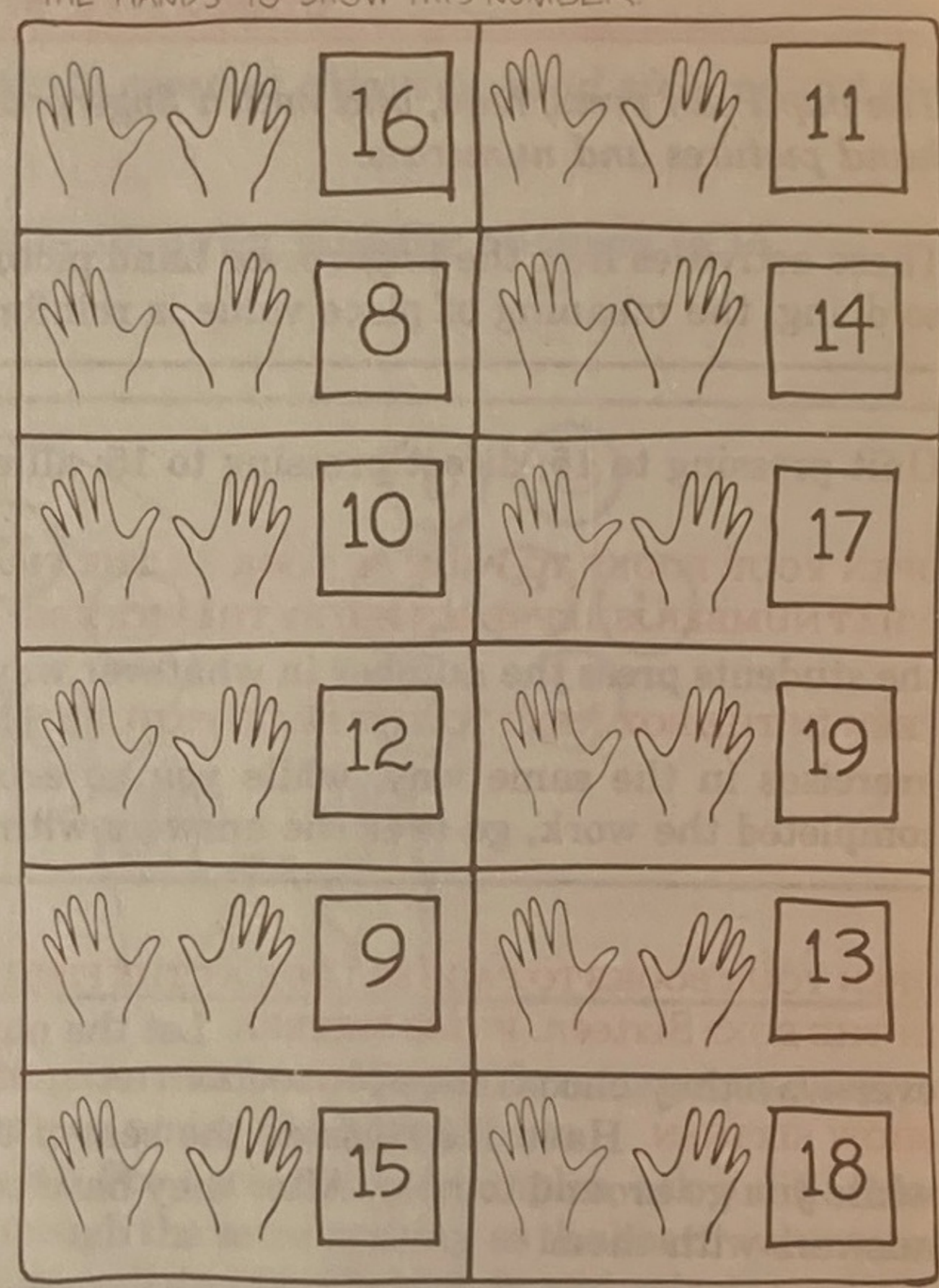
Paired-off buyers and sellers sit facing each other. The seller shuffles his cards, looks at the top card, and then fingerpresses the amount without showing the card to the buyer. The buyer reads the fingerpress and counts out that much in coins. If the buyer does not have the correct change, the seller makes change for him. Buyer and seller exchange coins for cards until all the cards have been purchased.

PRESS THE NUMBER SHOWN BY THE HANDS.
SAY IT. WRITE IT IN THE BOX.



84

PRESS THE NUMBER SHOWN IN THE BOX. COLOR
THE HANDS TO SHOW THIS NUMBER.



85

OBJECTIVE 68

The pupil can direct press 0 through 19.

Synopsis

Having recently combined the use of the 4 to 5, 9 to 10, and 14 to 15 exchanges, and having practiced pressing them by 1s, the pupil now is ready to work on direct pressing to 19. The instant recognition of finger values resulting from direct pressing will become a significant aid in performing more advanced operations later on in the Fingermath curriculum. It is the single most important skill to be mastered.

Warm-up

Unit counting to 15; direct pressing to 15; all exchanges.

Class Activity 68

Materials: Flash cards for the numbers 0 through 19

TODAY IS ANOTHER DIRECT PRESS DAY. FINGERS READY.
PRESS SIXTEEN. CLEAR YOUR FINGERS.
PRESS ELEVEN. CLEAR YOUR FINGERS.
PRESS NINE. CLEAR YOUR FINGERS.
PRESS EIGHTEEN. CLEAR YOUR FINGERS.
PRESS FIVE. CLEAR YOUR FINGERS.
PRESS FOURTEEN. CLEAR YOUR FINGERS.
PRESS SIX. CLEAR YOUR FINGERS.
PRESS SEVENTEEN. CLEAR YOUR FINGERS.
PRESS EIGHT. CLEAR YOUR FINGERS.
PRESS THIRTEEN. CLEAR YOUR FINGERS.
PRESS SEVEN. CLEAR YOUR FINGERS.
PRESS NINETEEN. CLEAR YOUR FINGERS.
PRESS TEN. CLEAR YOUR FINGERS.
PRESS TWELVE. CLEAR YOUR FINGERS.
PRESS FIFTEEN. CLEAR YOUR FINGERS.
PRESS FOUR. CLEAR YOUR FINGERS.

Now have the pupils silently press and clear numbers from the flash cards presented in random order. This exercise is to be used frequently.

unit

12

Using a Pencil while Finger-counting

Fingermath Prerequisites

No hard-and-fast rule can be made. The use of the pencil might be introduced after Unit 9, which covers subtraction from 4, but for many youngsters this may be too early. Do not let it interfere with good finger manipulation. After having introduced holding a pencil, occasionally encourage children in later units to try to do Fingermath at the same time.

Objective 69
*(TE page 157)**

The pupil can hold a pencil while fingercounting.

Book Activity 69A (page 86)**
Book Activity 69B (page 87)

Objective 70
(TE page 158)

The pupil can add and subtract using Fingermath and can write the sum or difference.

Class Activity 70
Book Activity 70 (page 88)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 69

The pupil can hold a pencil while fingercounting.

Synopsis

This objective will prove helpful in later work. The pencil is held as in the illustrations. This activity can be moved forward or backward in the sequence. However, if it is taught earlier, appropriate adjustments should be made in the curriculum content. (See *The Complete Book of Fingermath,* page 91.)

Book Activity 69A
(page 86)

Distribute pencils and have the class observe your demonstration of how to hold a pencil for fingerpressing. Have them do the same, trying to hold a pencil with the hand in the clear position and then in the press 1 position. (Left-handed children will press 10.)

Have the pupils try these positions alternately. Do not give the children pencils that are too long to work with. Clearly, the smaller a child's hand, the more difficulty that child may experience. Let the degree of difficulty guide you in continued work with a pencil.

Have the class do the sums and differences on page 86, attempting to keep pencils in hand as they manipulate.

Book Activity 69B
(page 87)

The purpose of the activity is to reinforce the child's ability to hold a pencil while doing Fingermath manipulations. Have the class open to page 87. Do the sum 4 + 5 = with the class, and have them write their answers in the space provided. Have volunteers come to the front and attempt to manipulate counting while holding a piece of chalk and pressing, backs to class, on the surface of the board.

HOLD YOUR PENCIL AS YOU DO EACH EXAMPLE. WRITE YOUR ANSWER.

+ 1 + 1 = 2		
1+1=	1+3=	7-1=
2+1=	2+4=	9-5=
2+2=	1+1=	8-2=
3+1=	2+2=	5-1=
4+1=	1+2=	6-3=
4+2=	6-2=	7-6=
5+1=	7-3=	8-5=
2+5=	9-3=	9-8=
3+4=	8-5=	4-3=

86

HOLD YOUR PENCIL AS YOU DO EACH EXAMPLE. WRITE YOUR ANSWER.

4 +5	3 +6	9-8+5=
		8-5+6=
9 -7	5 +2	7-4+6=
		6+3-8=
3 +5	8 -5	5+4-9=
		8-4+5=
7 -6	9 -3	9-8+6=
		3+6-7=
6 +3	8 -6	6-4+5=
		1+8-6=
9 -4	6 -4	8-7+4=
		7+2-8=

87

OBJECTIVE 70

The pupil can add and subtract using Fingermath and can write the sum or difference.

Synopsis The dual purpose of this objective is to introduce an instruction for recording sums and differences on paper and to give students practice in manipulating Fingermath with a pencil in hand.

Class Activity 70 PENCILS READY. PRESS SIX. PRESS THREE MORE. PRESS SEVEN MORE. READ YOUR FINGERS. Sixteen. NOW WRITE THAT NUMBER.

Discuss and rehearse the reading and writing responses a few times. The value of this activity depends on your ability to say the numbers at a pace appropriate to the skill level of your class. If your group is very diverse, you may have to work with two or more separate groups.

Do all of the following examples in order for the class to gain dexterity and accuracy. If you make up additional examples, remember that you have not yet taught the 10 to 9 exchange.

7 – 5 + 1 READ YOUR FINGERS AND WRITE THE NUMBER.
6 – 2 + 4
3 + 6 – 5
9 – 8 + 6
9 – 7 + 6
6 – 1 + 3
8 – 5 + 4
5 + 3 – 6
4 + 3 – 5
2 + 5 – 3
9 – 5 + 3
7 – 3 + 4
5 – 3 + 8
5 – 4 + 6
2 + 7 – 5
4 + 3 – 6
8 – 3 + 4
3 + 4 – 2
2 + 7 – 8
8 – 7 + 6
3 + 4 – 5
7 – 5 + 3
6 – 5 + 7
7 – 6 + 7
1 + 7 – 4
4 + 5 – 7
2 + 3 – 4
1 + 6 – 2
8 – 6 + 3
4 + 5 – 2

Book Activity 70 (page 88) Have the class work on these vertical subtraction examples alone, four at a time. Check their answers. If there are many errors go over the second set of four with the class. Otherwise, let the class finish the page without further assistance.

SUBTRACT AND WRITE YOUR ANSWER.
HOLD ONTO YOUR PENCIL.

9 -8 ___	7 -5 ___	5 -4 ___	8 -7 ___
4 -2 ___	9 -6 ___	8 -4 ___	9 -5 ___
6 -3 ___	7 -4 ___	5 -5 ___	4 -3 ___
8 -3 ___	9 -2 ___	6 -5 ___	7 -3 ___
5 -3 ___	8 -2 ___	7 -7 ___	5 -2 ___

88

unit

13

Adding to 14

Basal Reference

1. Practice with single-digit sums to 14.
2. Counting physical objects to 14.
3. Place value.

Fingermath Prerequisites

Units 1 through 7, 10, 11

*Objective 71 (TE page 163)**

The pupil can identify three distinct ways to add 1 in Fingermath.

Book Activity 71 (page 89)**

Objective 72 (TE page 165)

The pupil can add 2 one-digit numbers with sums to 10, 11, 12, 13, and 14, using Fingermath.

Class Activity 72A
Book Activity 72A (page 90)
Class Activity 72B
Class Activity 72C
Class Activity 72D
Book Activity 72B (page 91)
Class Activity 72E
Class Activity 72F
Book Activity 72C (page 92)
Class Activity 72G
Class Activity 72H
Book Activity 72D (page 93)
Book Activity 72E (page 94)
Class Activity 72I
Class Activity 72J
Book Activity 72F (page 95)
Game Activity 72

Objective 73 (TE page 173)

The pupil can add sums to 14 of two addends, with one addend larger than 9, or of three addends, using Fingermath.

Book Activity 73A (page 96)
Book Activity 73B (page 97)
Book Activity 73C (pages 98, 99, and 100)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 71

The pupil can identify three distinct ways to add 1 in Fingermath.

Synopsis

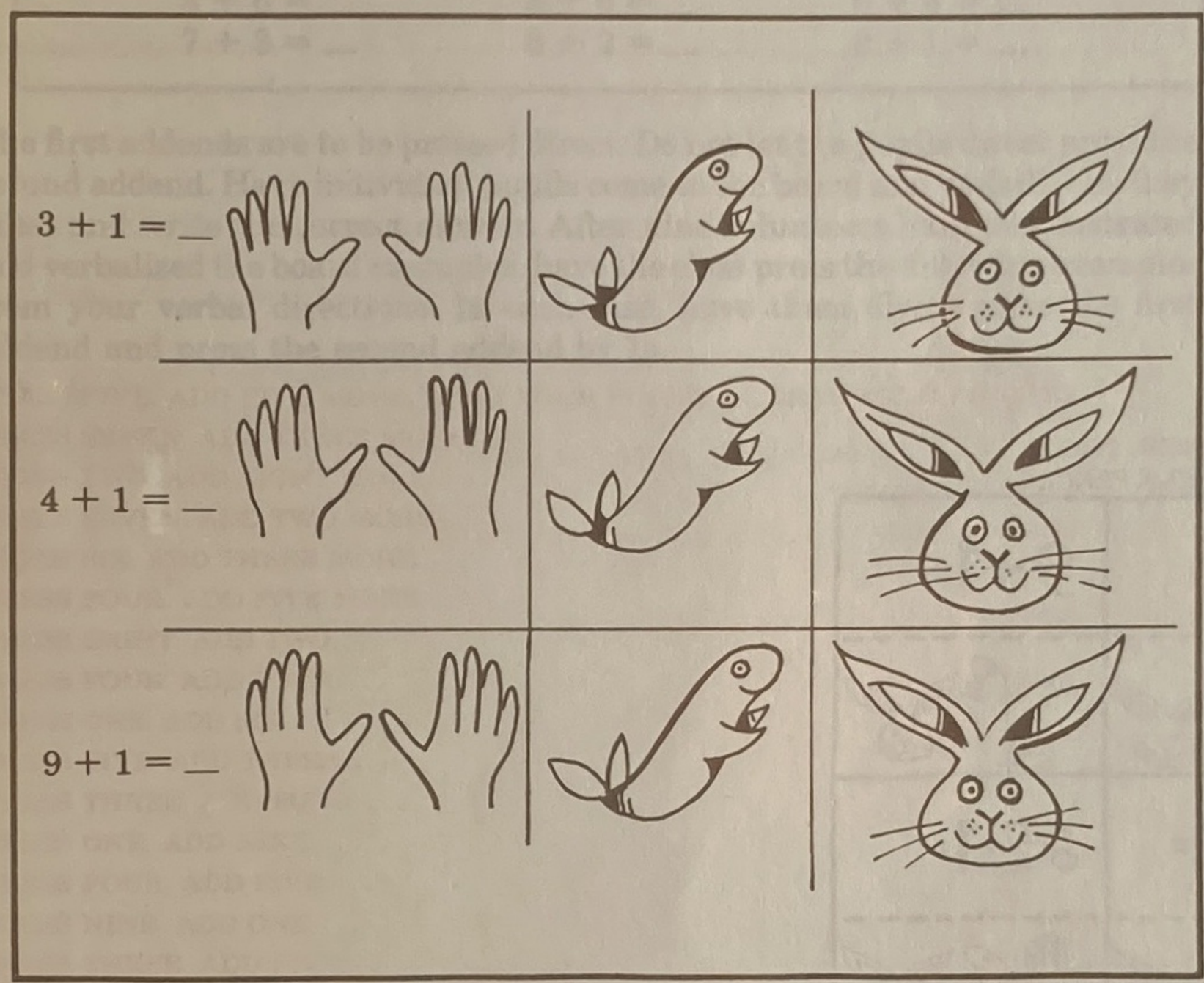
The 9 to 10 exchange is the third way now available to pupils to add 1. As pointed out earlier, the intention here is to develop a growing awareness that the 4 to 5 exchange (the little flipper) and now the 9 to 10 exchange (the little hopper) both add 1, just as pressing a finger adds 1. Because the 4 to 5 exchange and the 9 to 10 exchange are at different levels of abstraction, they deserve special attention.

Warm-up

Unit counting to 19; direct pressing to 19.

Book Activity 71
(page 89)

Board:



Have a pupil come to the board and press the first addition example.

HOW DID YOU ADD ONE IN THIS ADDITION EXAMPLE? I pressed one on my pinky (or words to that effect). DID YOU USE YOUR FINGER, OR THE FLIPPER, OR THE HOPPER TO ADD ONE? My finger. FINE, THEN CIRCLE THE FINGERS OF THE HAND TO SHOW THAT YOU USED THE FINGERS TO ADD ONE IN THIS CASE.

Have another child come to the board and press the second addition example.

HOW DID YOU ADD ONE IN THIS ADDITION EXAMPLE? I used the little flipper (or words to that effect). FINE, THEN CIRCLE THE LITTLE FLIPPER TO SHOW THAT YOU USED THE FLIPPER TO ADD ONE IN THIS CASE.

Have a third child come to the board and press the third addition example.

HOW DID YOU ADD ONE IN THIS ADDITION EXAMPLE? I used the little hopper (or words to that effect). GOOD, THEN CIRCLE THE LITTLE HOPPER TO SHOW THAT YOU USED THE HOPPER TO ADD ONE IN THIS CASE. NOW TURN TO PAGE 89 IN YOUR BOOKS. FOR EACH EXAMPLE ON THIS PAGE, I WANT YOU TO FIGURE OUT WHETHER YOU USED YOUR FINGERS, THE LITTLE FLIPPER, OR THE LITTLE HOPPER TO ADD ONE.

YOU'LL HAVE TO TRY EACH ONE ON YOUR FINGERS. WE HAVE COLORED THE ONE TO BE ADDED TO REMIND YOU THAT YOU ARE TO ADD ONE.

If necessary, work each of the sums with the class, letting them circle or color in the fingers, the flipper, or the hopper.

ADD THE NUMBERS. WRITE THE ANSWER. CIRCLE THE WAY YOU ADDED 1. HOLD ONTO YOUR PENCIL.

4+1=	8+1=	9+1=
3+1=	4+5+1=	6+2+1=
2+2+1=	3+4+1=	7+2+1=
2+4+1=	4+3+1 =	5+4+1=

89

OBJECTIVE 72

The pupil can add 2 one-digit numbers with sums to 10, 11, 12, 13, and 14, using Fingermath.

Synopsis

Practice is provided at levels of increasing difficulty. Successive activities cover sums to 10, to 11, to 12, to 13, and to 14.

Warm-up

Counting by 1s to 19; direct pressing to 19.

Class Activity 72A

Board:

1 + 9 = __	2 + 8 = __	3 + 7 = __
4 + 6 = __	5 + 5 = __	6 + 4 = __
7 + 3 = __	8 + 2 = __	9 + 1 = __

The first addends are to be pressed direct. Do not let the pupils direct press the second addend. Have individual pupils come to the board and verbalize as they press and write the correct answer. After nine volunteers have demonstrated and verbalized the board examples, have the class press the following examples from your verbal directions. In each case, have them direct press the first addend and press the second addend by 1s.

PRESS FIVE. ADD FIVE MORE. READ YOUR FINGERS. CLEAR YOUR FINGERS.
PRESS SEVEN. ADD THREE MORE. . . .
PRESS TWO. ADD EIGHT MORE. . . .
PRESS SEVEN. ADD TWO MORE. . . .
PRESS SIX. ADD THREE MORE. . . .
PRESS FOUR. ADD FIVE MORE. . . .
PRESS EIGHT. ADD TWO. . . .
PRESS FOUR. ADD FOUR. . . .
PRESS ONE. ADD SIX. . . .
PRESS FIVE. ADD THREE. . . .
PRESS THREE. ADD FOUR. . . .
PRESS ONE. ADD NINE. . . .
PRESS FOUR. ADD FIVE. . . .
PRESS NINE. ADD ONE. . . .
PRESS THREE. ADD FIVE. . . .
PRESS SIX. ADD TWO. . . .
PRESS SIX. ADD FOUR. . . .
PRESS THREE. ADD SIX. . . .
PRESS FIVE. ADD THREE. . . .
PRESS THREE. ADD SEVEN. . . .
PRESS TWO. ADD SIX. . . .
PRESS EIGHT. ADD ONE. . . .
PRESS FOUR. ADD SIX. . . .

Warm-up

Counting by 1s; direct pressing to 19.

Book Activity 72A
(page 90)

Board:

7 + 2 = __
7 + 3 = __

Begin by reviewing the previous lesson. Have individual pupils do the two examples on the board, reminding them that only the first addends can be pressed direct. Then turn to page 90. Allow the class to work four examples at a time. Go over each set of four with the class.

Class Activity 72B Internalization Drill:

Materials: Flash cards of sums to 10 used in previous activities.

EVERYBODY SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE SUM, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR THE ANSWER.

Warm-up Counting by 1s; direct pressing to 19.

Class Activity 72C Board:

2 + 9 = __	3 + 8 = __	4 + 7 = __
5 + 6 = __	6 + 5 = __	8 + 3 = __
9 + 2 = __	7 + 4 = __	

Only the first addend may be pressed direct. Do not let the pupils press the second addend direct.

Have individual pupils come to the board and verbalize as they press and write the correct answer. After the eight volunteers have demonstrated and verbalized the board examples, have the class press the following examples from your oral directions:

PRESS THREE. ADD SIX. READ YOUR FINGERS. CLEAR YOUR FINGERS.
PRESS TWO. ADD NINE. . . .
PRESS THREE. ADD SEVEN. . . .
PRESS FOUR. ADD FIVE. . . .
PRESS SEVEN. ADD FOUR. . . .
PRESS TWO. ADD EIGHT. . . .
PRESS FIVE. ADD SEVEN. . . .
PRESS EIGHT. ADD THREE. . . .
PRESS SIX. ADD FIVE. . . .
PRESS TWO. ADD SIX. . . .
PRESS FOUR. ADD SEVEN. . . .
PRESS SEVEN. ADD FIVE. . . .
PRESS EIGHT. ADD ONE. . . .
PRESS FIVE. ADD SIX. . . .
PRESS FOUR. ADD FIVE. . . .
PRESS NINE. ADD THREE. . . .
PRESS THREE. ADD EIGHT. . . .
PRESS THREE. ADD SEVEN. . . .
PRESS NINE. ADD TWO. . . .
PRESS FOUR. ADD SIX. . . .
PRESS SIX. ADD SIX. . . .
PRESS EIGHT. ADD FOUR. . . .

Class Activity 72D Internalization Drill:

Materials: Flash cards of sums to 11.

EVERYBODY SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE SUM, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR AN ANSWER.

Counting by 1s; direct pressing to 19. **Warm-up**

Turn to page 91. Allow the class to work four examples at a time. Then go over each set of four with the class. **Book Activity 72B** (page 91)

Counting by 1s; direct pressing to 19. **Warm-up**

Board: **Class Activity 72E**

3 + 9 = __	4 + 8 = __	5 + 7 = __
6 + 6 = __	7 + 5 = __	8 + 4 = __
9 + 3 = __		

Only the first addend may be pressed direct. Do not let the pupils press the second addend direct.

Have individual pupils come to the board and verbalize as they press and write the correct answer. After the volunteers have demonstrated and verbalized the board examples, have the class press the following examples from your oral directions:

PRESS THREE. ADD NINE. READ YOUR FINGERS. CLEAR YOUR FINGERS.
PRESS TWO. ADD EIGHT. . . .
PRESS THREE. ADD SEVEN. . . .
PRESS FOUR. ADD EIGHT. . . .
PRESS SIX. ADD FOUR. . . .
PRESS TWO. ADD EIGHT. . . .
PRESS FIVE. ADD SEVEN. . . .
PRESS EIGHT. ADD THREE. . . .
PRESS SIX. ADD FOUR. . . .
PRESS TWO. ADD SIX. . . .
PRESS FOUR. ADD EIGHT. . . .
PRESS FIVE. ADD FIVE. . . .
PRESS EIGHT. ADD ONE. . . .
PRESS FIVE. ADD SIX. . . .
PRESS FOUR. ADD FIVE. . . .
PRESS FIVE. ADD THREE. . . .
PRESS THREE. ADD EIGHT. . . .
PRESS THREE. ADD SEVEN. . . .
PRESS NINE. ADD TWO. . . .
PRESS FOUR. ADD SIX. . . .
PRESS SIX. ADD FIVE. . . .
PRESS EIGHT. ADD ONE. . . .

Internalization Drill: **Class Activity 72F**

Materials: Flash cards of sums to 12.

EVERYBODY SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE SUM, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR AN ANSWER.

Turn to page 92. Allow the class to work four examples at a time. Then go over each set of four with the class. **Book Activity 72C** (page 92)

Counting by 1s; direct pressing to 19. **Warm-up**

Class Activity 72G Board:

4 + 9 = __	5 + 8 = __	6 + 7 = __
7 + 6 = __	8 + 5 = __	9 + 4 = __

Only the first addend may be pressed direct. Do not let the pupils press the second addend direct.

Have individual pupils come to the board and verbalize as they press and write the correct answer. After the volunteers have demonstrated and verbalized the board examples, have the class press the following examples from your oral directions:

PRESS FOUR. ADD SIX. READ YOUR FINGERS. CLEAR YOUR FINGERS.
PRESS EIGHT. ADD FIVE. . . .
PRESS TWO. ADD SEVEN. . . .
PRESS THREE. ADD SEVEN. . . .
PRESS FIVE. ADD THREE. . . .
PRESS THREE. ADD SIX. . . .
PRESS SIX. ADD SEVEN. . . .
PRESS SIX. ADD SIX. . . .
PRESS THREE. ADD NINE. . . .
PRESS NINE. ADD FOUR. . . .
PRESS FOUR. ADD NINE. . . .
PRESS ONE. ADD NINE. . . .
PRESS THREE. ADD SIX. . . .
PRESS FIVE. ADD EIGHT. . . .
PRESS ONE. ADD EIGHT. . . .
PRESS FOUR. ADD EIGHT. . . .
PRESS EIGHT. ADD TWO. . . .
PRESS FOUR. ADD FIVE. . . .
PRESS SIX. ADD THREE. . . .
PRESS SEVEN. ADD FIVE. . . .
PRESS TWO. ADD EIGHT. . . .
PRESS SEVEN. ADD SIX. . . .
PRESS FIVE. ADD SIX. . . .

Class Activity 72H Internalization Drill:

Materials: Flash cards of sums to 13.

EVERYBODY SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE SUM, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR AN ANSWER.

Warm-up Counting by 1s; direct pressing to 19.

Book Activity 72D (page 93) Turn to page 93. Allow the class to work four examples at a time. Then go over each set of four with the class.

Book Activity 72E (page 94) Board:

___ + ___ = __
___ + ___ = __

Materials: A pair of dice.

One pupil stands at the front of the room and acts as dice roller and announcer for the entire class. Each roll of the dice yields two addends, which the pupils record in the space provided on page 94. They fingerpress the two addends and record the sum. After four such rolls they review their answers with you. A different child then becomes the roller and announcer. This activity can be continued until the page is filled or until the time runs out.

Begin by asking two children to come to the board and act out the two roles of announcer and class, the latter recording the addends and the sum on the board model.

Counting by 1s; direct pressing to 19. **Warm-up**

Board: **Class Activity 72I**

5 + 9 = __	6 + 8 = __	7 + 7 = __	8 + 6 = __
9 + 5 = __	4 + 9 = __	5 + 8 = __	6 + 7 = __
7 + 6 = __	8 + 5 = __	9 + 4 = __	

Only first addend may be pressed direct. Have individual pupils come to the board and verbalize as they press and write the correct answer. After all of the board examples have been done, give the class the following oral examples to do:

PRESS NINE. ADD FOUR. READ YOUR FINGERS. CLEAR YOUR FINGERS.
PRESS SIX. ADD EIGHT. . . .
PRESS FIVE. ADD EIGHT. . . .
PRESS FOUR. ADD NINE. . . .
PRESS SEVEN. ADD SIX. . . .
PRESS SEVEN. ADD SEVEN. . . .
PRESS EIGHT. ADD FIVE. . . .
PRESS FIVE. ADD NINE. . . .
PRESS SIX. ADD SEVEN. . . .
PRESS EIGHT. ADD SIX. . . .
PRESS NINE. ADD FIVE. . . .

Internalization Drill: **Class Activity 72J**

Materials: Flash cards of sums to 14.

EVERYBODY SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE SUM, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR AN ANSWER.

Counting by 1s; direct pressing to 19. **Warm-up**

Turn to page 95. Allow the class to work four examples at a time. Then go over each set of four with the class. **Book Activity 72F** (page 95)

FINGERMATH GAME: ADDING TO 14 **Game Activity 72**

Materials: Each pupil contributes numeral cards 0 through 7.

Five pupils are grouped together, with one of them acting as dealer. The dealer collects the cards from the group, shuffles them, and lays them face down. The object of the game is to get as close to 14 as possible without exceeding it.

Children by turns may take as many cards as they like from the top of the pile, while recording them by fingerpressing, until they either go over 14, in which case they stop automatically, or they stop asking for more cards. The closer a pupil can get to 14 without going over, the better.

After all the players have taken as many cards as they want, the group compares totals to see who came closest to 14. After every round, a different pupil takes over as dealer. It may be necessary to have a single group start playing while the class watches, to make certain that everyone has the rules straight.

ADD AND WRITE THE ANSWER. DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

3+7=	9+1=
6+2=	2+6=
2+7=	5+5=
4+6=	4+5=
1+8=	4+6=
8+2=	3+5=
7+2=	2+8=
1+9=	7+1=
6+3=	5+3=
7+3=	6+4=
4+5=	3+4=
3+5=	3+7=

90

ADD AND WRITE THE ANSWER. DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

6+4=	3+6=
2+9=	9+2=
7+2=	6+4=
3+5=	7+3=
6+5=	4+7=
3+7=	5+4=
3+8=	2+6=
4+5=	8+3=
2+8=	4+6=
5+6=	7+4=
2+7=	4+4=
5+5=	9+1=

91

ADD AND WRITE THE ANSWER DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

7 + 4 =	3 +9	4 +6
5 + 6 =		
9 + 1 =	9 +2	8 +4
6 + 6 =		
8 + 3 =	3 +8	7 +5
9 + 1 =		
6 + 5 =	4 +9	2 +9
7 + 3 =		
2 + 8 =	8 +2	5 +7
6 + 4 =		
9 + 3 =	5 +5	4 +8
3 + 7 =		

92

ADD AND WRITE THE ANSWER, DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

8 + 5 =	5 +5	6 +7
7 + 4 =		
4 + 8 =	9 +2	4 +6
9 + 3 =		
6 + 5 =	5 +7	9 +4
7 + 3 =		
5 + 8 =	4 +7	8 +3
7 + 6 =		
8 + 4 =	9 +1	5 +6
6 + 6 =		
4 + 9 =	6 +4	7 +5
8 + 2 =		

93

WRITE DOWN BOTH NUMBERS. ADD THEM.
WRITE THE ANSWER.

___ + ___ = ___	___ + ___ = ___
___ + ___ = ___	___ + ___ = ___
___ + ___ = ___	___ + ___ = ___
___ + ___ = ___	___ + ___ = ___
___ + ___ = ___	___ + ___ = ___
___ + ___ = ___	___ + ___ = ___
___ + ___ = ___	___ + ___ = ___
___ + ___ = ___	___ + ___ = ___
___ + ___ = ___	___ + ___ = ___

94

ADD AND WRITE THE ANSWER. DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

7+5=	9 +5	5 +7
6+4=		
5+9=	9 +1	8 +5
8+3=		
9+2=	8 +6	9 +3
7+4=		
6+8=	7 +7	6 +6
5+6=		
9+4=	5 +8	5 +5
7+3=		
6+5=	8 +4	7 +6
6+7=		

95

OBJECTIVE 73

The pupil can add sums to 14 of two addends, with one addend larger than 9, or of three addends, using Fingermath.

Synopsis

Addition with one addend larger than 9 is not dealt with in basal texts until the child has been taught columnar addition. With Fingermath, no such constraints are needed, since Fingermath addition is cumulative. That is to say, addends are accumulated and stored on the child's fingers without regard to columnar form. At a later stage, when the basal text covers addition of two-digit numbers, children will find it easy to do such work by Fingermath.

Warm-up

Unit counting and direct pressing to 19.

Book Activity 73A (page 96)

Have the class turn to page 96 and work on the examples alone, four at a time. Check their answers. If there are a great many errors, go over the next set of four with the class. Otherwise, let them continue without further assistance.

Book Activity 73B (page 97)

Have the class turn to page 97 and work on these addition examples alone, four at a time. Check their answers. If there are a great many errors, go over the next set of four with the class. Otherwise, let them continue without further assistance.

ADD AND WRITE THE ANSWER, DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

1 +10	9 +4	6+5=
		2+11=
3 +8	3 +11	7+4=
		11+3=
7 +3	6 +6	3+7=
		6+8=
8 +5	0 +12	3+9=
		4+6=
4 +8	9 +2	11+2=
		9+3=
4 +10	2 +8	6+7=
		2+12=

96

ADD AND WRITE THE ANSWER, DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

8 +6	9 +1	0+10=
		3+10=
5 +5	5 +9	5+6=
		10+4=
5 +8	8 +2	0+11=
		10+2=
7 +7	10 +0	12+1=
		13+1=
2 +9	11 +1	10+1=
		1 +11=
10 +3	1 +12	12+2=
		0+13=

97

Book Activity 73C (pages 98, 99, and 100)

Have the class work on these examples alone, four at a time. Check their answers. If there are a great many errors, go over the next set of four with the class. Otherwise, let them continue without further assistance.

ADD AND WRITE THE ANSWER, DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

4+3+7=	3 5 +4	5 3 +4
6+1+4=		
5+4+5=	2 6 +5	6 4 +3
3+3+8=		
4+4+4=	2 7 +5	4 4 +5
5+2+4=		
6+3+5=	4 5 +2	5 5 +3
5+2+7=		
5+4+2=	6 3 +2	4 5 +5
4+3+6=		
4+2+8=	5 6 +1	3 5 +6
6+3+3=		

98

ADD AND WRITE THE ANSWER, DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

1 5 +8	3 2 +7	5+8+1=
		6+2+5=
5 2 +5	4 4 +6	4+1+6=
		2+3+8=
2 1 +10	3 4 +5	3+4+6=
		4+6+3=
6 2 +3	4 2 +6	1+3+9=
		2+2+10=
3 2 +8	1 4 +9	4+5+4=
		3+5+5=
5 3 +5	4 9 +1	3+3+6=
		5+4+4=

99

ADD AND WRITE THE ANSWER; DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

5 2 +6	6 5 +3	5+7+2=
		3+8+2=
6 1 +3	3 2 +9	5+7+1=
		2+3+9=
3 6 +4	2 5 +6	1+5+7=
		6+2+4=
5 3 +6	5 4 +3	4+5+3=
		2+7+4=
3 1 +9	6 2 +6	4+3+4=
		6+7+1=
4 2 +7	1 7 +5	4+6+2=
		2+8+3=

100

Fingermath is still new. We, at McGraw-Hill, look to the experience of classroom teachers for assistance in improving the Fingermath educational program. We will be most grateful if you could take ten minutes to fill out this questionnaire and mail it to us. We will be happy to send you, in return, a template which can be used to draw hands on the chalkboard. Your name will also be placed in a bi-monthly lottery. During the next two years the winners of these lotteries will be awarded educational books.

RESEARCH RESPONSE

Date: _____

1. _____
   Name (please print)

2. _____
   School
   _____
   Address
   _____
   City State Zip

3. K☐ 1☐ 2☐ 3☐ 4☐
   Grade(s) I am teaching ☐ _____

4. _____
   Basal Math Program Used

5. I am ☐ am not ☐ coordinating the FINGERMATH TE Curriculum with the basal program.

6. As of this date I have taught Fingermath through

   Objective # _____

7. My average Fingermath lesson lasts _____ minutes.

8. I teach Fingermath to a class _____ days each week.

9. I learned Fingermath skills from: (Check as many as appropriate)
   a. Another teacher ☐
   b. The Complete Book of Fingermath (CBF) ☐
   c. A workshop ☐ . . . duration _____ Hours.

10. The Teacher's Edition is ☐ is not ☐ easy to follow.

11. The Teacher's Edition is ☐ is not ☐ used regularly as a curriculum guide.

12. I have ☐ have not ☐ coordinated pages from CBF as a reference for Fingermath teaching.

13. The exercises in the pupil's book are ☐ are not ☐ useful.
If not, why? _____

_____

14. I assign additional Fingermath work, such as: _____

_____

15. On the whole, Fingermath is ☐ is not ☐ reinforcing the computational skills of the pupils.

16. Number of pupils _____. Boys _____. Girls _____.

17. Of this number, _____ are making excellent progress with Fingermath
_____ are just managing to keep up
_____ are not doing well

18. Of this number, _____ are characterized as learning disabled.

19. These LD pupils are ☐ are not ☐ learning Fingermath.

20. These LD pupils have ☐ have not ☐ been helped by Fingermath.
Please Explain: _____

_____

_____

21. The Teacher's Edition is ☐ is not ☐ well structured.
If not, please suggest how to improve: _____

_____

_____

22. The Pupil's Book does ☐ does not ☐ contain enough material.
If not, which portions should be increased or improved? _____

23. _____ other Fingermath classes are taught in my school in grades _____.

24. I would recommend the following modifications, additions or deletions in the Primary Fingermath program: _____

_____

_____

25. I would ☐ would not ☐ be interested in receiving ongoing data regarding general teacher reaction to the Fingermath program.

Send response to: Edwin M. Lieberthal
Fingermath, Dept. TP
McGraw-Hill Book Company
1221 Avenue of the Americas
New York, NY 10020

unit

14

Adding to 19

Basal Reference	1. Practice with single-digit addends to 19. 2. Place value. 3. Counting objects by 1s to 19.
Fingermath Prerequisites	Units 1 through 7 and 10 through 12
Objective 74 *(TE page 179)**	*The pupil can make the 14 to 15 exchange while adding.* Class Activity 74 Book Activity 74 (page 101)**
Objective 75 *(TE page 181)*	*The pupil can add sums by Fingermath to 19 both horizontally and vertically.* Book Activity 75A (page 102) Game Activity 75 Book Activity 75B (page 103) Book Activity 75C (page 104) Book Activity 75D (page 105)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 74

The pupil can make the 14 to 15 exchange while adding.

Synopsis

This objective is intended to give pupils an opportunity to try the 4 to 5, 9 to 10, and 14 to 15 exchanges. The first activity should allow each child to verbalize individually.

Warm-up

Counting by 1s and direct pressing to 19; sums to 14; special attention to the 14 to 15 exchange.

Class Activity 74

Board:

9 + 6	8 + 4 + 4
8 + 8	7 + 5 + 3
9 + 9	6 + 9 + 4
7 + 8	8 + 5 + 1
9 + 4	6 + 8 + 5
6 + 9	4 + 7 + 6
7 + 6	3 + 9 + 5
8 + 7	8 + 5 + 2
6 + 8	7 + 7 + 5
9 + 5	8 + 3 + 1
7 + 9	6 + 2 + 7
8 + 9	3 + 2 + 4
7 + 5	8 + 3 + 4
9 + 7	7 + 2 + 3
7 + 7	5 + 4 + 6
8 + 6	7 + 9 + 4
9 + 9	9 + 3 + 4
6 + 7	7 + 4 + 6
9 + 8	6 + 8 + 6

All the children should take turns leading the class in pressing and verbalizing a sum. It is assumed that most pupils will direct press the first addend. However, the second and third addends should be pressed by 1s.

Warm-up

Counting by 1s; direct pressing to 19.

Book Activity 74
(page 101)

Have the class turn to page 101. Do the first two or three examples with them. Unless you think the class is not ready, let them work the rest of the exercise alone.

ADD AND WRITE THE ANSWER; DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

9+5=	9+9=
8+6=	9+6=
4+9=	8+7=
6+7=	9+8=
5+8=	6+5=
3+9=	7+9=
7+6=	8+8=
8+9=	4+8=
6+8=	6+9=
5+7=	9+7=

101

OBJECTIVE 75

The pupil can add sums by Fingermath to 19 both horizontally and vertically.

Synopsis

In this series of activities the children handle both the 4 to 5 and the 9 to 10 exchanges in the same sum.

Warm-up

Counting by 1s and direct pressing to 19.

Book Activity 75A (page 102)

Have the pupils turn to page 102 in their books and do the examples, four at a time. At the end of each four examples, stop and review the work. If you cannot finish the work in one day, continue in the next session.

Materials: Two sets of numeral cards 4 through 9 for every three or four pupils.

Game Activity 75

The pupils form playing groups of four, who take turns dealing the cards two to a child. The three children who are not dealing add the numbers on the pairs of cards and check their answers with each other. After four deals, the dealership changes hands, so that everyone has a chance to be dealer.

Book Activity 75B (page 103)

Have the class turn to page 103 and work on these addition examples alone. This set of exercises is intended as an indicator of the children's progress. After the class has finished, collect them for record-keeping purposes.

ADD AND WRITE THE ANSWER. DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

6+9=	9+7=	3+6+8=
8+8=	9+8=	2+5+7=
9+9=	7+5=	6+4+8=
8+7=	7+9=	3+7+9=
4+9=	7+7=	6+8+6=
9+6=	6+8=	6+4+7=
6+7=	7+6=	7+3+9=
7+8=	8+9=	4+9+7=
8+6=	5+8=	4+4+8=
5+9=	9+9=	3+5+7=

102

ADD AND WRITE THE ANSWER; DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

7+9=	8 +6	9 +9
9+8=		
8+8=	7 +9	9 +6
9+4=		
7+5=	9 +8	5 +9
9+9=		
6+9=	7 +7	8 +8
6+8=		
8+9=	9 +7	8 +9
9+7=		
9+3=	8 +7	8 +5
7+8=		

103

These exercises contain three addends. They are intended to provide additional practice, especially for more advanced students.

Book Activity 75C
(page 104)

These exercises contain three addends. They are intended to provide additional practice, especially for more advanced students.

Book Activity 75D
(page 105)

ADD AND WRITE THE ANSWER; DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

8+2+9=	8 6 +5	5 7 +3
5+3+7=		
8+3+5=	6 5 +5	9 3 +3
6+4+6=		
7+5+5=	8 5 +3	8 2 +9
8+2+9=		
7+7+1=	5 5 +5	9 5 +3
6+8+2=		
5+6+4=	8 7 +1	7 5 +6
8+4+7=		
8+4+5=	6 2 +8	9 5 +2
7+4+6=		

104

ADD AND WRITE THE ANSWER; DIRECT PRESS ONLY THE FIRST NUMBER. HOLD ONTO YOUR PENCIL.

4+5+9=	6 9 +1	3 7 +7
6+3+7=		
7+2+8=	7 4 +8	5 6 +8
8+1+9=		
2+7+9=	2 5 +8	9 1 +5
6+7+3=		
8+8+2=	4 6 +6	8 3 +8
6+1+9=		
5+8+2=	5 5 +8	6 3 +6
8+2+8=		
9+4+3=	6 3 +8	5 4 +7
6+3+9=		

105

unit

15

Counting by 2s and 10s

Basal Reference

1. Counting by 2s should be preceded by counting of objects.
2. Counting by 10s should be preceded by counting by 10s to 100.

Fingermath Prerequisites

Units 1 through 7, 10, 11

Objective 76
*(TE page 187)**

The pupil can count and fingerpress numbers in pairs.
Book Activity 76A (page 106)**
Book Activity 76B (page 107)
Book Activity 76C (page 108)

Objective 77
(TE page 191)

The pupil can count and fingerpress numbers by 10s.
Book Activity 77 (page 109)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 76

The pupil can count and fingerpress numbers in pairs.

Synopsis

This objective teaches students to skip-count. Skip-counting is an activity preliminary to learning multiplication tables. Fingermath is unusually well suited to the process.

Warm-up

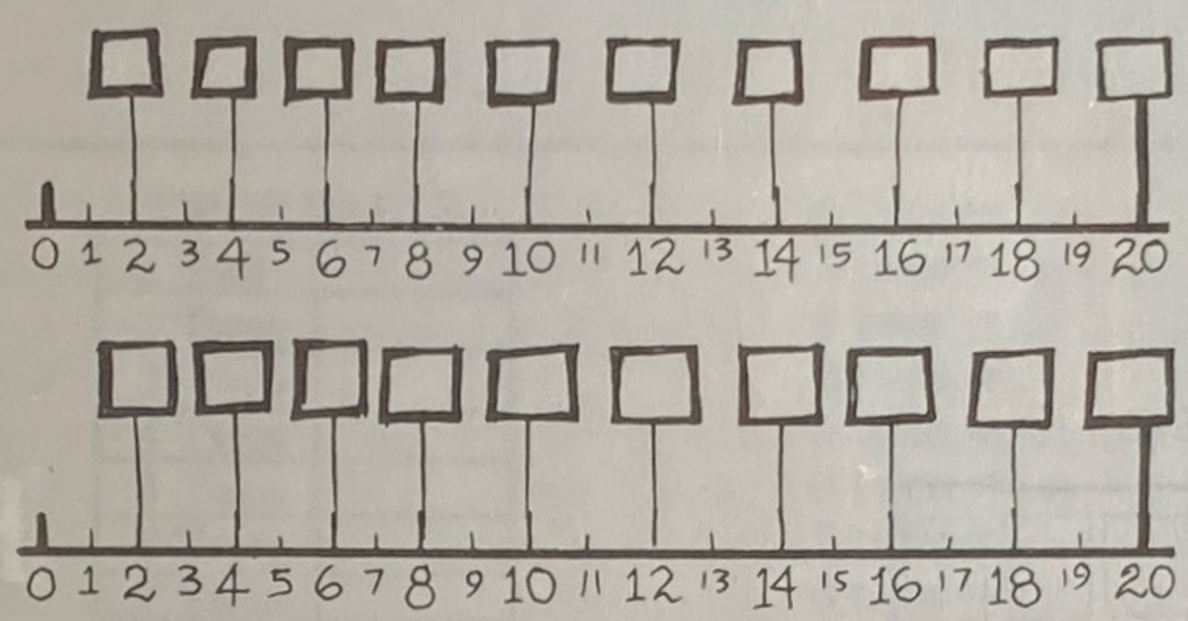
Unit counting to 20; direct pressing to 20; exchanges to 20.

Vocabulary

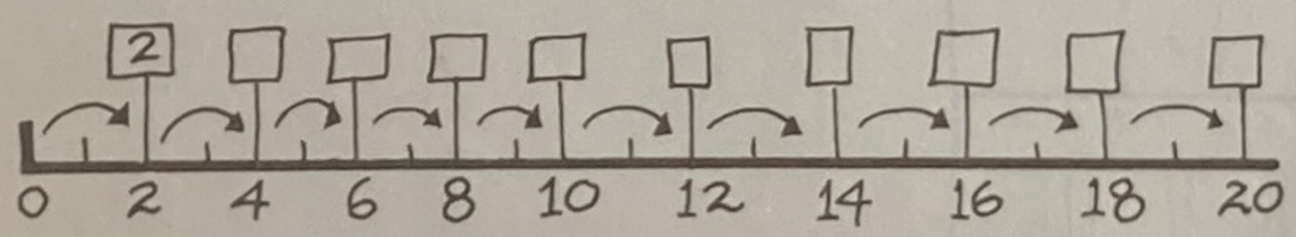
Skip-counting; *one* 2; *two* 2s; *three* 2s; *four* 2s; *five* 2s; *six* 2s; *seven* 2s; *eight* 2s; *nine* 2s; *ten* 2s

Book Activity 76A
(page 106)

Board:



Begin by teaching the class to recite the following sequence rhythmically while clapping their hands to the double cadence: *One* two; *two* twos; *three* twos; *four* twos; *five* twos; *six* twos; *seven* twos; *eight* twos; *nine* twos; *ten* twos. Have individual pupils lead the class in reciting and clapping the beat. After practicing the skip-count this verbal way, proceed to practice the double beat of the skip-count cadence while fingerpressing unit by unit, from 1 to 20. This should be done very slowly, because concentration is needed to coordinate a new verbal pattern with finger movements, and speed would in any case be useless for the assignment that follows. Practice combined skip-counting and fingerpressing by having individual pupils lead the class in verbalizing. Next, have a volunteer come to the board to *slowly* press by twos and verbalize, while you make the loops on the board as shown below.



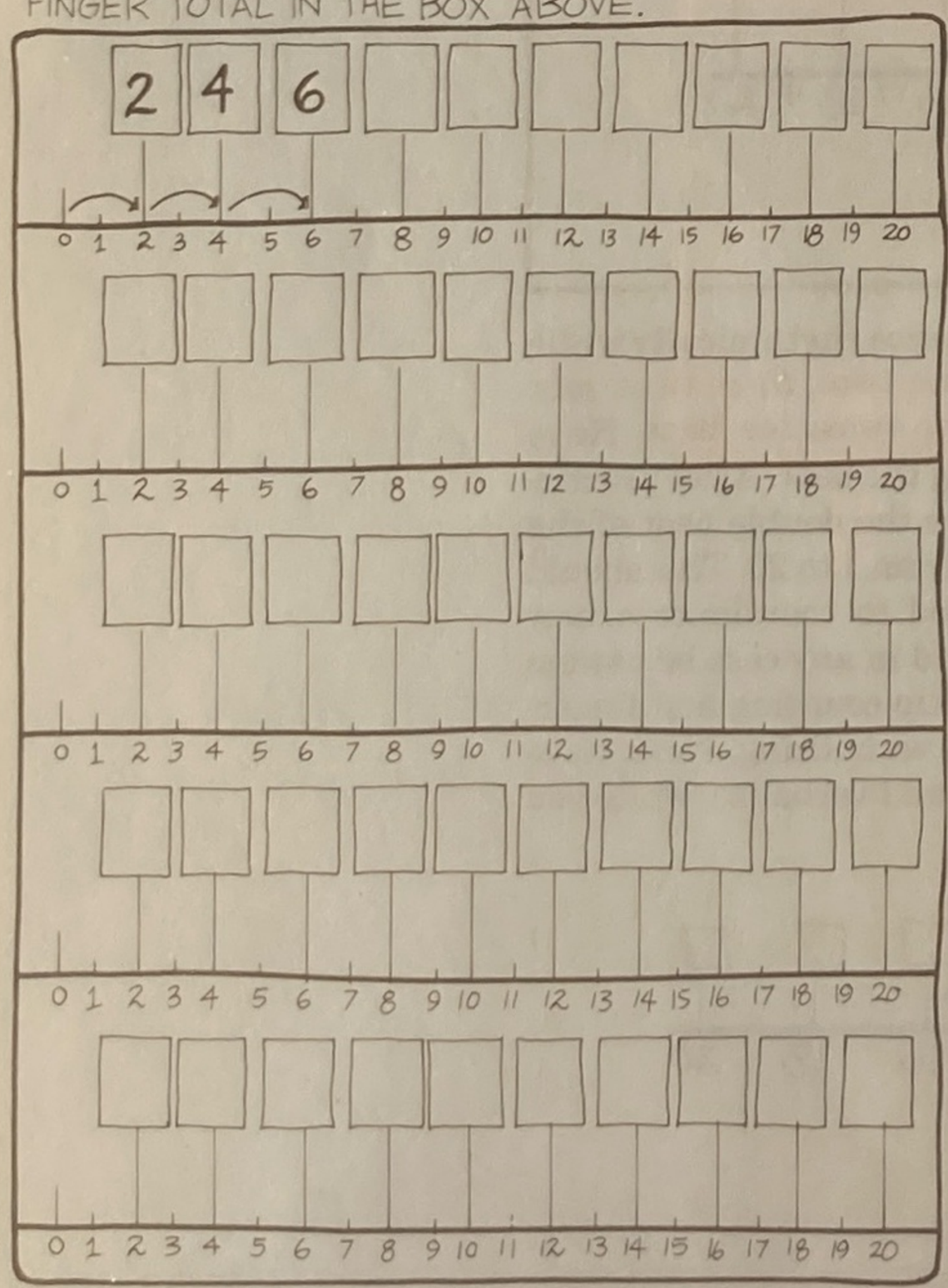
Each time the child says the second word—in this case *two(s)*—you make the loop, speak the number appearing below the line, and write it in the box above. Example:

Pupil One two.
Teacher Draw loop to next even number. TWO. Write 2 in box.
Pupil Two twos.
Teacher Draw loop. FOUR. Write 4 in box.
Pupil Three twos.
Teacher Draw loop. SIX. Write 6 in box.
Pupil Four twos.

Continue in this way to 20. After demonstrating once with the teacher making the loops and speaking the numbers, switch roles and let the volunteer pupil make the loops, verbalize, and write in the boxes, while you press and count by 2s.

Then pair off the children and have them open their books to page 106. Let them practice each role five times. Note that the first two number lines have even numbers printed in color and the last three do not.

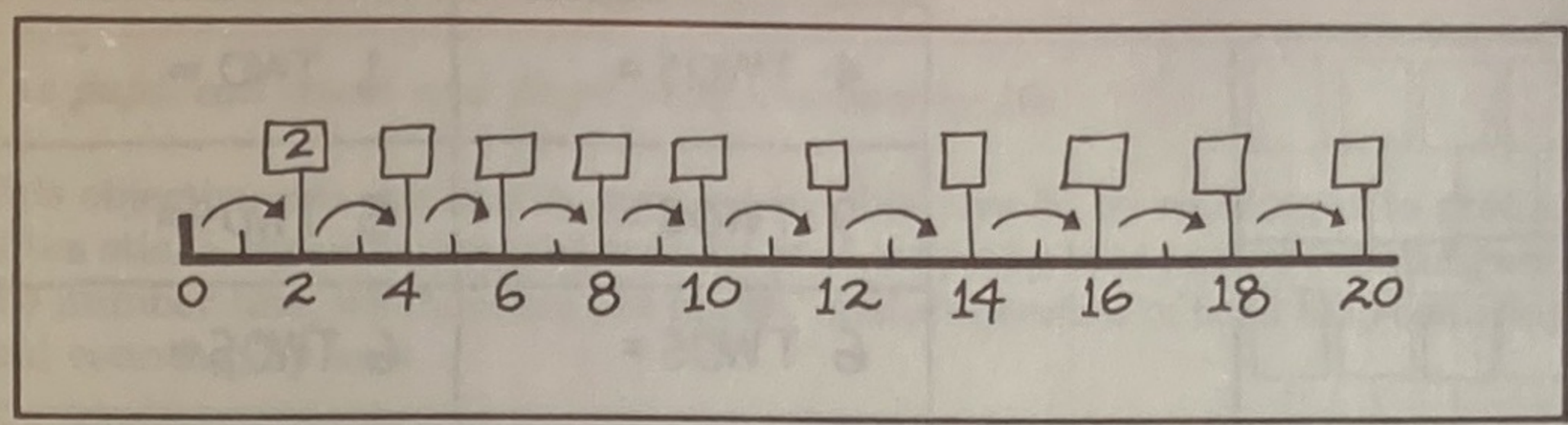
COUNT TWOS.. DRAW EACH LOOP. WRITE EACH NEW FINGER TOTAL IN THE BOX ABOVE.



106

Board:

Book Activity 76B
(page 107)



Ask two volunteers to come to the board. The first is to skip-count slowly while fingerpressing: *One* two; *two* twos; *three* twos; *four* twos; *five* twos; *six* twos; *seven* twos; *eight* twos; *nine* twos; *ten* twos. Meanwhile, the second child makes the two loops and speaks the numbers: Two, four, six, eight, ten, twelve, fourteen, sixteen, eighteen, twenty on the twos beat and writes these numbers in the boxes over the number line. Then have the class open their books to page 107. Pair off the children. Each pupil is to take five turns at each of the two roles, skip-counting and marking.

Board:

Book Activity 76C
(page 108)

TWOS TABLE

1 Two	
2 Twos	
3 Twos	
4 Twos	
5 Twos	
6 Twos	
7 Twos	
8 Twos	
9 Twos	
10 Twos	

4 twos = __
3 twos = __
8 twos = __
2 twos = __
5 twos = __
9 twos = __
7 twos = __
6 twos = __

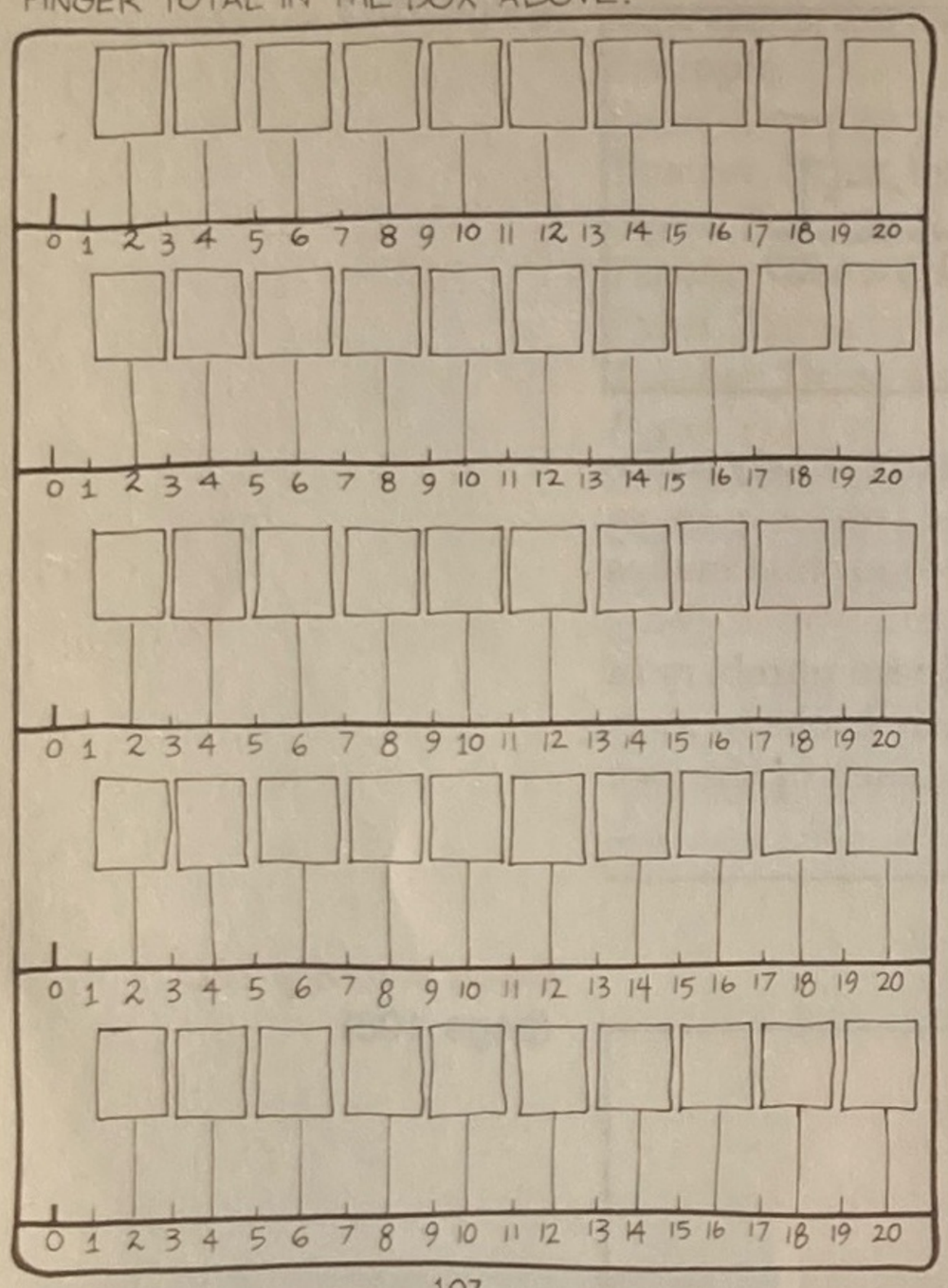
Begin by teaching the class how to skip-count to four twos. Demonstrate: *ONE* TWO; *TWO* TWOS; *THREE* TWOS; *FOUR* TWOS. READ YOUR FINGERS. Eight. Write 8 next to the first equal sign on the board:

4 twos = 8

Have different pupils come to the board and lead the class in skip-counting and verbalizing one of the board examples.

Next, call on individual pupils to skip-count and verbalize amounts randomly selected by you. Then fill in the twos table by having the whole class skip-count each item in the table. Finally, have the class open their books to page 108 and do the examples in the same way as they did the board work.

COUNT TWOS.. DRAW EACH LOOP WRITE EACH NEW FINGER TOTAL IN THE BOX ABOVE.



107

PRESS THE NUMBER OF TWOS SHOWN. WRITE THE TOTAL.

4 TWOS=	1 TWO =
9 TWOS=	5 TWOS=
6 TWOS=	6 TWOS=
1 TWO =	2 TWOS=
7 TWOS=	8 TWOS=
5 TWOS=	3 TWOS=
2 TWOS=	4 TWOS=
8 TWOS=	9 TWOS=
3 TWOS=	7 TWOS=

108

OBJECTIVE 77

The pupil can count and fingerpress numbers by 10s.

Synopsis

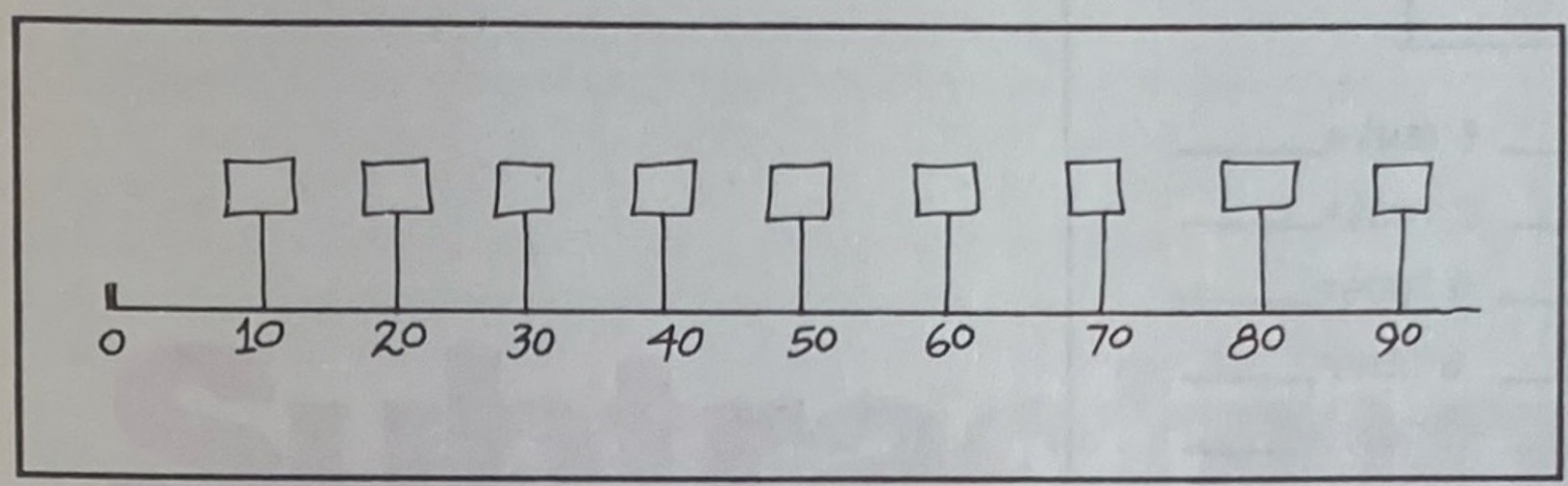
This objective was previously covered in Objective 57 by relating it to groups of ten sticks. By extending the concept of counting by tens to skip-counting and the number line, we increase the pupils' comprehension of both skip-counting and counting by tens.

Warm-up

Skip-counting by 2s (Objective 76).

Book Activity 77
(page 109)

Board:



In counting by 10s in Fingermath, each successive number is reached by a direct press rather than by counting off units, as was done for the twos table in the previous objective. Inform the class that one could go through the slow cadence of pressing 1s to reach 10, but the direct press on the left hand is so easy and fast that we will use it instead. The fact that the direct press has the same cadence should be noted. The major variation from skip-counting twos is that only one finger is required to complete each press of ten. (*ONE* TEN, *TWO* TENS, *THREE* TENS, *FOUR* TENS, *FIVE* TENS, *SIX* TENS, *SEVEN* TENS, *EIGHT* TENS, *NINE* TENS.) We have to stop at nine tens because we are not yet ready to go beyond 99.

Have the class slowly skip-count and fingerpress by 10s while a volunteer at the board marks their progress by making loops and writing the correct numbers in the boxes above each decade.

Next, have class open their books to page 109. Do each of the tens-table products with them. Then let them complete the rest of the page by themselves, reminding them that the examples contain twos as well as tens facts.

PRESS THE NUMBER OF TENS SHOWN. WRITE DOWN THE TOTAL.

TENS TABLE

1 TEN	
2 TENS	
3 TENS	
4 TENS	
5 TENS	
6 TENS	
7 TENS	
8 TENS	
9 TENS	

9 TWOS=____ 9 TENS=____ 8 TENS=____

3 TENS=____ 3 TWOS=____ 2 TWOS=____

8 TWOS=____ 2 TENS=____ 4 TWOS=____

3 TENS=____ 5 TWOS=____ 6 TENS=____

6 TWOS=____ 4 TENS=____ 7 TENS=____

5 TENS=____ 7 TWOS=____

109

unit

16

Subtracting from 14

Basal Reference

1. Activities that use counters to subtract from 14.
2. As mentioned in Unit 8, some basal programs use missing addends as part of their subtraction program. If your text does not include missing addends, skip Objective 80.
3. A math balance or balance scale is a useful aid when addressing the subject of missing addends.

Fingermath Prerequisites

Units 1 through 13

*Objective 78 (TE page 195)**

The pupil can make the 10 to 9 exchange called the back hop.

Class Activity 78

Objective 79 (TE page 196)

The pupil can identify three distinct ways to subtract 1 in Fingermath.

Book Activity 79 (page 110)**

Objective 80 (TE page 198)

The pupil can supply a missing addend in a number equation with totals up to 14.

Book Activity 80A (page 111)
Book Activity 80B (page 112)

Objective 81 (TE page 200)

The pupil can subtract one number from minuends to 14.

Class Activity 81A
Book Activity 81A (page 113)
Class Activity 81B
Class Activity 81C
Book Activity 81B (page 114)
Class Activity 81D
Class Activity 81E
Book Activity 81C (page 115)
Class Activity 81F
Class Activity 81G
Book Activity 81D (page 116 and 117)

Objective 82 (TE page 205)

The pupil practices and memorizes basic addition and subtraction facts.

Class Activity 82

Objective 83 (TE page 206)

The pupil can correctly complete arithmetic exercises involving either addition or subtraction involving numbers to 14.

Book Activity 83 (pages 118 and 119)

Objective 84 (TE page 207)

The pupil can correctly complete arithmetic exercises involving both addition with sums to 19 and subtraction with minuends not exceeding 14.

Book Activity 84 (page 120)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 78

The pupil can make the 10 to 9 exchange called the back hop.

Synopsis

With this skill, the child is equipped to perform a large variety of arithmetical operations without difficulty. Be sure to associate the term *back hop* repeatedly with the proper hand motion. Stress the fact that the back hop is just one more way of subtracting 1 or clearing 1.

Warm-up

Clearing from 9; direct pressing to 19.

Class Activity 78

PRESS NINE. nine. HOLD ON TO THAT PRESS. HOW DO WE GET FROM 9 TO 10? By using the little hopper (or words to that effect). PRESS TWO MORE. One, two. READ YOUR FINGERS. Eleven. CLEAR ONE. One. READ YOUR FINGERS. Ten. IF I WANT TO CLEAR ANOTHER FINGER, I WILL HAVE TO MAKE A *BACK HOP*, LIKE THIS. Demonstrate. WHO CAN TELL ME HOW TO DO A BACK HOP? Clear ten and press nine (or) Lift your left index finger and press all the fingers of your right hand. If the children cannot describe what to do in words, let them show you on their own fingers. AND THAT BACK HOP SUBTRACTS ONE OR CLEARS ONE. EVERYBODY CLEAR ONE. One. CLEAR YOUR FINGERS. Do the 10 to 9 exchange several times.

You may find it advantageous to refer back to the story of the Little Hopper and to suggest an image of Little Hopper jumping back into his parents' yard. Practice back hopping by working the following exercises with the class. It is a good idea to mix in a few addition examples so that the pupils practice both back hopping and hopping forwards. The addition examples below are marked with an asterisk. Accentuate them vocally so that the pupils will know that something different is coming.

PRESS TEN. CLEAR ONE. READ YOUR FINGERS. CLEAR YOUR FINGERS.
PRESS TWELVE. CLEAR THREE. . . .
PRESS FOURTEEN. CLEAR FIVE. . . .
PRESS ELEVEN. CLEAR TWO. . . .
PRESS TEN. CLEAR FOUR. . . .
PRESS ELEVEN. CLEAR FIVE. . . .
*PRESS EIGHT. PRESS FOUR MORE . . .
PRESS TWELVE. CLEAR SIX. . . .
PRESS FOURTEEN. CLEAR SEVEN. . . .
PRESS THIRTEEN. CLEAR EIGHT. . . .
*PRESS NINE. PRESS FIVE MORE . . .
*PRESS SEVEN. PRESS SEVEN MORE. . . .
PRESS THIRTEEN. CLEAR FIVE. . . .
PRESS TWELVE. CLEAR SEVEN. . . .
PRESS TEN. CLEAR THREE. . . .
PRESS FOURTEEN. CLEAR SIX. . . .
PRESS THIRTEEN. CLEAR SEVEN. . . .
PRESS ELEVEN. CLEAR FOUR. . . .
*PRESS EIGHT. PRESS FIVE MORE . . .
PRESS TWELVE. CLEAR FIVE. . . .
PRESS FOURTEEN. CLEAR EIGHT. . . .

OBJECTIVE 79

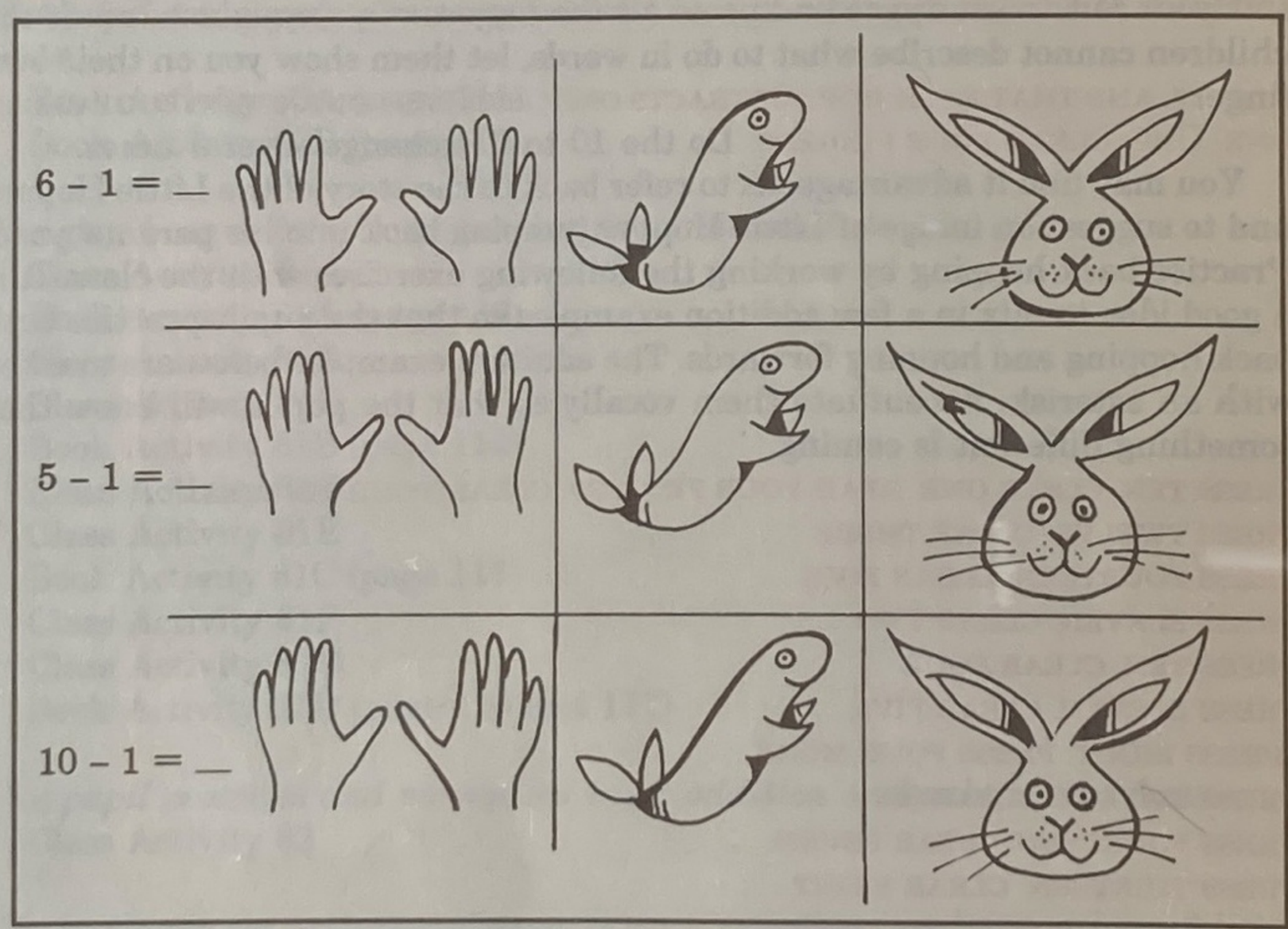
The pupil can identify three distinct ways to subtract 1 in Fingermath.

Synopsis Just as in addition there are a number of ways to add 1, so also in subtraction there are a number of ways to subtract 1.

The 10 to 9 exchange is the third way now available to pupils to subtract 1. As has previously been pointed out, the reason for the emphasis on the ways to subtract 1 is to develop a growing awareness in the child that the 5 to 4 exchange, and now the 10 to 9 exchange, in effect subtract 1 just as clearing a finger does. The 5 to 4 and 10 to 9 exchanges deserve special attention and practice.

Warm-up Clearing from 10 repeatedly.

Book Activity 79 (page 110) Board:



Have a pupil come to the board and fingerpress the first example.

HOW DID YOU SUBTRACT ONE IN THIS EXAMPLE? I cleared one (or) I cleared my index finger (or words to that effect). DID YOU USE YOUR FINGER, THE FLIPPER, OR THE HOPPER TO SUBTRACT ONE? My finger. FINE, THEN CIRCLE THE FINGERS OF THE HAND TO SHOW THAT YOU USED THE FINGERS TO SUBTRACT ONE IN THIS CASE.

Have another pupil come to the board and fingerpress the second subtraction example.

HOW DID YOU SUBTRACT ONE IN THIS SUBTRACTION EXAMPLE? I used the flipper (or) I lifted my thumb and pressed my four fingers (or words to that effect). FINE, THEN CIRCLE THE FLIPPER TO SHOW THAT YOU USED IT TO SUBTRACT ONE IN THIS CASE.

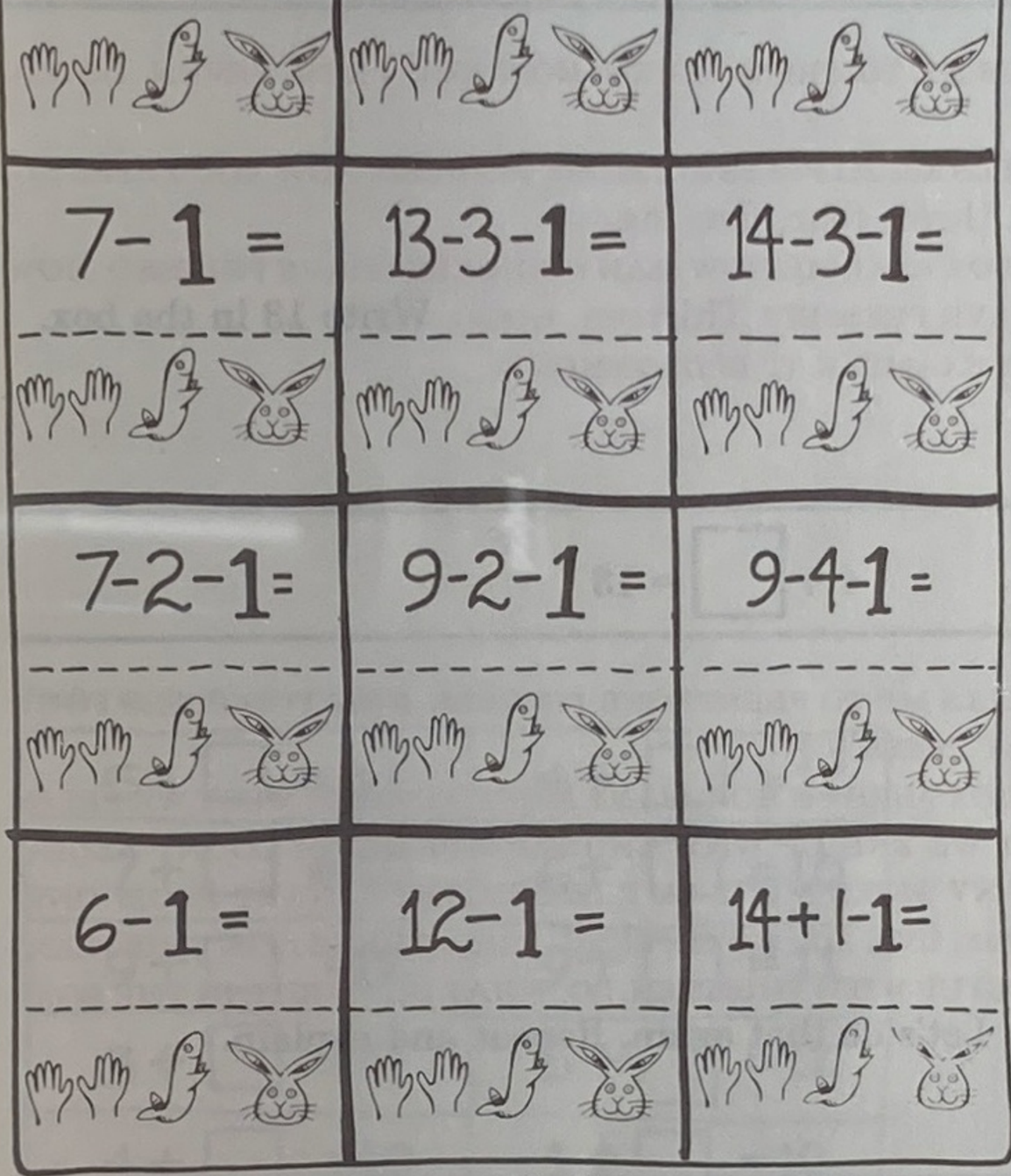
Follow the same procedure for the third example on the board. Then have the class turn to page 110 in their books.

FOR EACH EXAMPLE ON THIS PAGE, I WANT YOU TO FIGURE OUT, BY TRYING IT ON YOUR FINGERS, WHETHER YOU USE YOUR FINGERS, THE FLIPPER, OR THE HOPPER TO SUBTRACT ONE. WE HAVE COLORED THE NUMBER ONE THAT IS TO BE SUBTRACTED IN ORDER TO REMIND YOU THAT YOU ARE *SUBTRACTING* ONE.

You may have to do three or four exercises with the class to make sure they have grasped the idea.

SUBTRACT. WRITE THE ANSWER. CIRCLE THE WAY *YOU* CLEARED 1.

5-1 =	11-1 =	10-1=
7-1 =	13-3-1 =	14-3-1=
7-2-1=	9-2-1 =	9-4-1 =
6-1 =	12-1 =	14+1-1=



110

OBJECTIVE 80

The pupil can supply a missing addend in a number equation with totals up to 14.

Synopsis If your basal text does not cover missing addends, skip this objective.

The 9 to 10 exchange has to be learned before this objective is used. (Review *The Complete Book of Fingermath,* pages 62–63.)

Warm-up Direct pressing numbers to 14; sums to 14.

Book Activity 80A (page 111) Board:

$$7 + 6 = \square$$

Point to the 7. THIS TELLS ME TO PRESS SEVEN. NOW YOU PRESS SEVEN. Seven. HOLD THAT PRESS NOW.

Point to the 6. THIS TELLS ME TO PRESS SIX MORE FINGERS. NOW YOU PRESS SIX MORE FINGERS. One, two, three, four, five, six.

Point to the box. THIS BOX ASKS ME HOW MANY FINGERS I HAVE PRESSED. HOW MANY FINGERS DO YOU HAVE PRESSED? Thirteen. GOOD. Write 13 in the box.

BUT NOW LOOK AT THIS EXAMPLE. IT IS DIFFERENT.

Board:

$$4 + \square = 13$$

Point to the four. THIS TELLS ME TO PRESS FOUR FINGERS. NOW YOU PRESS FOUR FINGERS. Four. HOLD THAT PRESS NOW.

Point to the box. THIS BOX ASKS US *HOW MANY MORE* FINGERS MUST WE PRESS (point to the 13) SO THAT WE END UP WITH THIRTEEN PRESSED? COUNT ALONG WITH ME TO SEE HOW MANY MORE MUST BE PRESSED. LET'S START FROM ONE. BEGIN! One, two, three, four, five, six, seven, eight, nine. THERE IT IS! THIRTEEN! I NEEDED NINE MORE TO END UP WITH THIRTEEN. SO, WHAT DO I WRITE IN THE BOX? Nine. Write 9 in the box. Let's do that again. Repeat and explain.

Board:

$$5 + \square = 11$$

Go through the same pattern with the class. Then have the class open their books to page 111. For each example, ask a different pupil to come to the board and lead the class, using the same verbalization pattern. Be sure that the children repeat the pattern correctly.

Direct pressing to 19.

Warm-up

Board:

Book Activity 80B
(page 112)

$7 + \square = 14$
$8 + \square = 13$

Ask volunteers to come to the board and demonstrate what to do and say for each of the board examples. After volunteers have completed the examples at the board, have the class turn to page 112 and work the examples.

FIND THE MISSING NUMBER. WRITE IT IN THE BOX.

5+ □ = 11	4+ □ =12
7+ □ =10	6+ □ =10
9+ □ =12	9+ □ =11
3+ □ =11	5+ □ =12
4+ □ =10	1+ □ =10
7+ □ =12	8+ □ =12
6+ □ =11	4+ □ =11
8+ □ =11	3+ □ =10
8+ □ =10	6+ □ =12
3+ □ =12	9+ □ =10
7+ □ =11	2+ □ =10
5+ □ =10	2+ □ =11

111

FIND THE MISSING NUMBER. WRITE IT IN BOX.

8 + □ = 11	2+ □ =11
7 + □ = 13	8+ □ =12
4 + □ = 11	7+ □ =14
8 + □ = 14	4+ □ =13
5+ □ = 12	7+ □ =11
6+ □ = 11	3+ □ =12
9+ □ = 12	6+ □ =14
6+ □ = 13	6+ □ =12
5+ □ =14	9 + □ =11
5+ □ =11	9 + □ =14
7+ □ =12	8 + □ =13
9 + □ =13	3 + □ =11

112

OBJECTIVE 81

The pupil can subtract one number from minuends to 14.

Warm-up Direct pressing to 14; clearing from 14.

Class Activity 81A Board:

11 - 1 = __	11 - 2 = __	11 - 3 = __
11 - 4 = __	11 - 5 = __	11 - 6 = __
11 - 8 = __	11 - 9 = __	11 - 7 = __

The pupils may direct press the addend, but they should be discouraged from attempts to direct clear. Have volunteers demonstrate and verbalize the board examples, then have the class press and clear the following, as you give verbal directions. In each case, have the class direct press the first addend and clear the subtrahend one by one.

PRESS TEN, CLEAR SIX, READ YOUR FINGERS, CLEAR YOUR FINGERS.
PRESS ELEVEN, CLEAR EIGHT
PRESS NINE, CLEAR FOUR
PRESS ELEVEN, CLEAR THREE
PRESS NINE, CLEAR SEVEN
PRESS TEN, CLEAR TWO
PRESS ELEVEN, CLEAR SIX
PRESS NINE, CLEAR EIGHT
PRESS TEN, CLEAR FOUR
PRESS ELEVEN, CLEAR NINE
PRESS NINE, CLEAR FIVE
PRESS TEN, CLEAR EIGHT
PRESS ELEVEN, CLEAR TWO
PRESS TEN, CLEAR FIVE
PRESS NINE, CLEAR SIX
PRESS TEN, CLEAR ONE
PRESS ELEVEN, CLEAR FOUR
PRESS NINE, CLEAR THREE
PRESS TEN, CLEAR SEVEN
PRESS ELEVEN, CLEAR ONE
PRESS NINE, CLEAR NINE
PRESS TEN, CLEAR THREE
PRESS ELEVEN, CLEAR SEVEN
PRESS TEN, CLEAR NINE
PRESS ELEVEN, CLEAR FIVE

Warm-up Pressing to 14; clearing from 14.

Book Activity 81A (page 113) Have the class turn to page 113. Have volunteers demonstrate the procedure learned in the previous lesson by verbalizing while pressing and clearing correctly. Then have the class work the rest of the examples by themselves.

Class Activity 81B Internalization Drill:
Materials: Flash cards of subtraction facts from 11.

EVERYONE SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE DIFFERENCE, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR THE ANSWER.

Direct pressing to 14; clearing from 14; subtraction from 11. **Warm-up**

Board: **Class Activity 81C**

12 – 1 = __	12 – 2 = __	12 – 3 = __
12 – 4 = __	12 – 5 = __	12 – 6 = __
12 – 8 = __	12 – 9 = __	12 – 7 = __

The pupils may direct press the addend, but they should be discouraged from attempts to direct clear. Have volunteers demonstrate and verbalize the board examples, then have the class press and clear the following as you give verbal directions. In each case, have the class direct press the first addend and clear the subtrahend one by one.

PRESS TWELVE, CLEAR EIGHT, READ YOUR FINGERS, CLEAR YOUR FINGERS.
PRESS TEN, CLEAR FOUR
PRESS ELEVEN, CLEAR SEVEN
PRESS TWELVE, CLEAR SIX
PRESS TEN, CLEAR FIVE
PRESS ELEVEN, CLEAR NINE
PRESS TWELVE, CLEAR THREE
PRESS TEN, CLEAR SIX
PRESS ELEVEN, CLEAR FOUR
PRESS TWELVE, CLEAR SEVEN
PRESS TEN, CLEAR EIGHT
PRESS ELEVEN, CLEAR FIVE
PRESS TEN, CLEAR SEVEN
PRESS TWELVE, CLEAR FIVE
PRESS ELEVEN, CLEAR EIGHT
PRESS TEN, CLEAR NINE
PRESS TWELVE, CLEAR FOUR
PRESS ELEVEN, CLEAR THREE
PRESS TWELVE, CLEAR NINE
PRESS ELEVEN, CLEAR SIX

Pressing to 14; clearing from 14. **Warm-up**

Have the class turn to page 114. Have volunteers demonstrate the procedure learned in the previous lesson by verbalizing, pressing, and clearing correctly. Then have the class work the rest of the examples by themselves. **Book Activity 81B** (page 114)

Internalization Drill: **Class Activity 81D**
Materials: Flash cards of subtraction from 12.

EVERYONE SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE DIFFERENCE, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR THE ANSWER.

Board: **Class Activity 81E**

13 – 1 = __	13 – 2 = __	13 – 3 = __
13 – 4 = __	13 – 5 = __	13 – 6 = __
13 – 8 = __	13 – 9 = __	13 – 7 = __

The pupils may direct press the addend, but should be discouraged from attempts to direct clear. Have volunteers demonstrate and verbalize the board examples, then have the class press and clear the following as you give verbal directions. In each case, have the class direct press the first addend and clear the subtrahend one by one.

PRESS TWELVE, CLEAR SIX, READ YOUR FINGERS, CLEAR YOUR FINGERS.
PRESS ELEVEN, CLEAR EIGHT
PRESS THIRTEEN, CLEAR FIVE
PRESS ELEVEN, CLEAR SIX
PRESS TWELVE, CLEAR EIGHT
PRESS THIRTEEN, CLEAR SIX
PRESS TWELVE, CLEAR FIVE
PRESS ELEVEN, CLEAR FIVE
PRESS THIRTEEN, CLEAR EIGHT
PRESS ELEVEN, CLEAR NINE
PRESS TWELVE, CLEAR SEVEN
PRESS THIRTEEN, CLEAR NINE
PRESS ELEVEN, CLEAR SEVEN
PRESS TWELVE, CLEAR NINE
PRESS THIRTEEN, CLEAR SEVEN

SUBTRACT. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. CLEAR ONE-BY-ONE. WRITE THE ANSWER.

10 − 4 =	11 − 1	10 − 6
11 − 7 =		
9 − 9 =	9 − 8	11 − 4
11 − 2 =		
10 − 7 =	10 − 1	9 − 7
9 − 4 =		
11 − 3 =	11 − 9	11 − 8
10 − 9 =		
11 − 5 =	10 − 5	9 − 5
9 − 6 =		

113

SUBTRACT. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. CLEAR ONE-BY ONE. WRITE THE ANSWER.

11 − 6 =	11 − 4	12 − 9
9 − 9 =		
12 − 4 =	11 − 7	9 − 6
10 − 7 =		
12 − 8 =	12 − 5	10 − 6
11 − 5 =		
12 − 7 =	11 − 8	12 − 6
10 − 8 =		
11 − 9 =	10 − 5	12 − 2
12 − 3 =		

114

Pressing to 14; clearing from 14 by 1s. **Warm-up**

Have the class turn to page 115. Have volunteers demonstrate the procedure learned in the previous lesson by verbalizing, pressing, and clearing correctly. Then have the class work the rest of the examples by themselves. **Book Activity 81C** (page 115)

Internalization Drill: **Class Activity 81F**

Materials: Flash cards of subtraction from 13.

EVERYONE SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE DIFFERENCE, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR THE ANSWER.

Direct pressing to 14; clearing from 14 by 1s. **Warm-up**

Board: **Class Activity 81G**

14 – 9 = __	14 – 8 = __	14 – 7 = __
14 – 6 = __	14 – 5 = __	14 – 4 = __
14 – 3 = __	14 – 2 = __	14 – 1 = __

SUBTRACT. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. CLEAR ONE-BY-ONE. WRITE THE ANSWER.

12-5=	11 -5	13 -3
11-8=		
13-4=	12 -8	13 -9
11-3=		
12-9=	11 -7	12 -4
13-7=		
11-6=	13 -8	11 -9
12-7=		
13-5=	13 -6	11 -4
12-6=		

115

While pupils may direct press the addend, discourage attempts to direct clear. Have volunteers demonstrate and verbalize the board examples, then have the class press and clear the following from your verbal directions. In each case, have the class direct press the first addend and clear the minuend one by one.

PRESS THIRTEEN, CLEAR SEVEN READ YOUR FINGERS, CLEAR YOUR FINGERS.
PRESS ELEVEN, CLEAR SIX
PRESS FOURTEEN, CLEAR EIGHT
PRESS THIRTEEN, CLEAR SIX
PRESS TWELVE, CLEAR EIGHT
PRESS TWELVE, CLEAR SIX
PRESS ELEVEN, CLEAR SEVEN
PRESS THIRTEEN, CLEAR EIGHT
PRESS TWELVE, CLEAR SEVEN
PRESS THIRTEEN, CLEAR NINE
PRESS FOURTEEN, CLEAR SEVEN
PRESS ELEVEN, CLEAR EIGHT
PRESS TWELVE, CLEAR NINE
PRESS FOURTEEN, CLEAR NINE

Warm-up

Pressing to 14; clearing from 14 by 1s.

Book Activity 81D
(page 116 and 117)

Have the class turn to page 116. Have volunteers demonstrate the procedure learned in the previous lesson by verbalizing, pressing and clearing correctly. Then have the class work the rest of the examples by themselves.

SUBTRACT. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. CLEAR ONE-BY-ONE. WRITE THE ANSWER.

13-6=	12 -4	13 -8
14-4=		
11-5=	14 -5	13 -3
14-7=		
12-8=	14 -9	12 -7
14-6=		
13-6=	11 -9	13 -5
14-8=		
13-9=	14 -3	13 -4
12-6=		

116

SUBTRACT. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. CLEAR ONE-BY-ONE. WRITE THE ANSWER.

12-5=	11 -4	14 -4
11-8=		
10-5=	13 -6	11 -2
12-7=		
11-3=	12 -8	10 -8
10-1=		
14-8=	10 -6	11 -5
13-7=		
12-8=	13 -4	12 -3
14-2=		

117

OBJECTIVE 82

The pupil practices and memorizes basic addition and subtraction facts.

Synopsis

This objective is part of the continuing program to develop skill building.

Class Activity 82

Internalization Drill:

Materials: Flash cards of addition facts to 14 and differences of facts from 14.

EVERYONE SIT ON YOUR RIGHT HAND. LET'S SEE HOW MUCH WE CAN REMEMBER WITHOUT USING OUR FINGERS. I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE ANSWER, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR THE ANSWER.

OBJECTIVE 83

The pupil can correctly complete arithmetic exercises involving either addition or subtraction involving numbers to 14.

Synopsis By alternating addition and subtraction, the pupil learns to pay attention to the operation involved.

Warm-up Clearing from 14 by 1s.

Book Activity 83 (pages 118 and 119)

Board:

$14 - 7 = _$
$9 + 5 = _$

Using the two board examples, discuss with the class the fact that you are mixing addition and subtraction examples. After helping the class with the first set of four examples, allow them to do succeeding sets of four examples by themselves. Check their work.

DO EACH EXAMPLE. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. WRITE THE ANSWER.

14-9=	9 +5	13 -9
6+8=		
12-4=	12 -6	5 +7
8-5=		
14-6=	8 +6	13 -6
4+9=		
14-8=	14 -7	7 +5
5+9=		
13-4=	3 +9	12 -5
9+3=		

118

DO EACH EXAMPLE. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. WRITE THE ANSWER.

7+7=	9 +4	12 -8
13-8=		
5+8=	13 -3	4 +8
14-5=		
8+4=	7 +6	13 -5
12-9=		
6+7=	13 -7	8 +6
14-4=		
14-3=	9 +5	12 -7
6+6=		

119

OBJECTIVE 84

The pupil can correctly complete arithmetic exercises involving both addition, with sums to 19, and subtraction with minuends not exceeding 14.

Pressing to 19; clearing from 14.

Warm-up

Board:

Book Activity 84
(page 120)

$13 - 8 + 6 = __$
$6 + 8 - 5 = __$
$14 - 6 + 3 = __$
$5 + 9 - 7 = __$
$11 - 8 + 9 = __$

Have volunteers come to the board and verbalize as they fingerpress the examples. For the first example on the board, the words might be Press thirteen. Clear eight. Press six (or) Add thirteen. Subtract eight. Add six.

Now turn to page 120. Do each of the other examples with the class, first having individual pupils verbalize and press the example. Then have the entire class verbalize, press, and write the answers for all the examples.

DO EACH EXAMPLE. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. WRITE THE ANSWER.

14-9+7=	7+7-5=
9+4-8=	12-8+9=
5+9-6=	14-9+7=
12-8+5=	5+8-7=
6+7-9=	8+6-9=
14-7+5=	7+6-8=
9+5-8=	13-9+6=
8+5-9=	6+8-7=
14-9+8	13-7+8=
4+9-6=	8-5+9=

120

unit

17

Subtracting from 19

Basal Reference	Activities that use counters to subtract from 19.
Fingermath Prerequisites	Units 1 through 16
Objective 85 *(TE page 211)**	Class Activity 85
Objective 86 *(TE page 212)*	*The pupil can subtract 1 one-digit number from minuends to 19.* Book Activity 86A (page 121)** Book Activity 86B (page 122) Book Activity 86C (page 123) Book Activity 86D (page 124) Book Activity 86E (page 125)
Objective 87 *(TE page 216)*	*The pupil practices and memorizes basic addition and subtraction facts.* Class Activity 87
Objective 88 *(TE page 217)*	*The pupil can correctly complete arithmetic exercises involving either addition or subtraction.* Book Activity 88A (page 126) Book Activity 88B (page 127)
Objective 89 *(TE page 218)*	*The pupil can correctly complete arithmetic exercises involving both addition and subtraction.* Book Activity 89 (page 128) The pupil can make the 15 to 14 exchange, the 10 to 9 exchange, and the 5 to 4 exchange in clearing from 19.

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 85

The pupil can make the 15 to 14 exchange, the 10 to 9 exchange, and the 5 to 4 exchange in clearing from 19.

Direct pressing to 19.

Warm-up

Class Activity 85

The procedure used for this class activity starts with the direct pressing of 19, which is rehearsed in the warm-up exercise. Spend a few minutes on this.

Have the class practice the 15 to 14 exchange, the 10 to 9 exchange, and the 5 to 4 exchange a number of times.

Begin the exercises by calling on individual pupils to press and clear an example. Plan to give each child a turn verbalizing, pressing, and clearing.

Press 19. 1-by-1, Clear 12. Read your fingers. Clear.
Press 19. 1-by-1, Clear 18.
Press 19. 1-by-1, Clear 16.
Press 19. 1-by-1, Clear 10.
Press 19. 1-by-1, Clear 13.
Press 19. 1-by-1, Clear 17.
Press 19. 1-by-1, Clear 11.
Press 19. 1-by-1, Clear 14.
Press 19. 1-by-1, Clear 19.
Press 19. 1-by-1, Clear 15.
Press 19. 1-by-1, Clear 11.
Press 19. 1-by-1, Clear 17.
Press 19. 1-by-1, Clear 13.
Press 19. 1-by-1, Clear 10.
Press 19. 1-by-1, Clear 15.
Press 19. 1-by-1, Clear 16.
Press 19. 1-by-1, Clear 17.
Press 19. 1-by-1, Clear 18.
Press 19. 1-by-1, Clear 12.
Press 19, 1-by-1, Clear 14.
Press 19. 1-by-1, Clear 19.
Press 19. 1-by-1, Clear 15.
Press 19. 1-by-1, Clear 12.
Press 19. 1-by-1, Clear 18.
Press 19. 1-by-1, Clear 16.
Press 19. 1-by-1, Clear 10.
Press 19. 1-by-1, Clear 13.
Press 19. 1-by-1, Clear 17.
Press 19. 1-by-1, Clear 11.
Press 19. 1-by-1, Clear 14.

OBJECTIVE 86

The pupil can subtract 1 one-digit number from minuends to 19.

Warm-up Direct pressing to 19 and clearing from 19 repeatedly.

Book Activity 86A (page 121) Board:

15 – 1 = __	15 – 2 = __	15 – 3 = __
15 – 4 = __	15 – 5 = __	15 – 6 = __
15 – 8 = __	15 – 9 = __	15 – 7 = __

The pupils may direct press the addend, but they should be discouraged from attempts to direct clear. Have volunteers come to the board and do the examples with verbalizations. Then have them turn to page 121 and do the examples.

Warm-up Direct pressing to 19 and clearing from 19 repeatedly.

Book Activity 86B (page 122) Board:

16 – 1 = __	16 – 2 = __	16 – 3 = __
16 – 4 = __	16 – 5 = __	16 – 6 = __
16 – 8 = __	16 – 9 = __	16 – 7 = __

The pupils may direct press the addend, but they should be discouraged from attempts to direct clear. Have volunteers come to the board and do the examples with verbalizations. Then have them turn to page 122 and do the examples.

Warm-up Direct pressing to 19 and clearing from 19 repeatedly.

Book Activity 86C (page 123) Board:

17 – 1 = __	17 – 2 = __	17 – 3 = __
17 – 4 = __	17 – 5 = __	17 – 6 = __
17 – 8 = __	17 – 9 = __	17 – 7 = __

The pupils may direct press the addend, but they should be discouraged from attempts to direct clear. Have volunteers come to the board and do the examples with verbalizations. Then have them turn to page 123 and do the examples.

Warm-up Direct pressing to 19 and clearing from 19 repeatedly.

Book Activity 86D (page 124) Board:

18 – 1 = __	18 – 2 = __	18 – 3 = __
18 – 4 = __	18 – 5 = __	18 – 6 = __
18 – 8 = __	18 – 9 = __	18 – 7 = __

The pupils may direct press the addend, but they should be discouraged from attempts to direct clear. Have volunteers come to the board and do the examples with verbalizations. Then have them turn to page 124 and do the examples.

Direct pressing to 19 and clearing from 19 repeatedly.

Warm-up

Board:

Book Activity 86E
(page 125)

19 – 1 = __	19 – 2 = __	19 – 3 = __
19 – 4 = __	19 – 5 = __	19 – 6 = __
19 – 8 = __	19 – 9 = __	19 – 7 = __

The pupils may direct press the addend, but they should be discouraged from attempts to direct clear. Have volunteers come to the board and do the examples with verbalizations. Then have them turn to page 125 and do the examples.

SUBTRACT. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. CLEAR ONE-BY-ONE. WRITE THE ANSWER.

13-5=	15 -4	14 -8
15-8=		
14-3=	12 -7	13 -9
15-6=		
12-6=	13 -6	14 -7
15-5=		
14-4=	15 -7	12 -8
13-8=		
14-5=	12 -9	13 -6
15-9=		

121

SUBTRACT. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. CLEAR ONE-BY-ONE. WRITE THE ANSWER.

16-8=	13 -6	15 -4
15-6=		
13-3=	16 -9	14 -6
15-7=		
16-4=	15 -8	16 -5
14-9=		
13-5=	13 -8	14 -7
16-6=		
13-4=	15 -9	16 -7
14-3=		

122

SUBTRACT. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. CLEAR-ONE-BY-ONE. WRITE THE ANSWER.

17-8=	14 -7	17 -6
15-9=		
14-4=	16 -9	15 -6
16-8=		
17-5=	17 -9	16 -7
15-7=		
14-9=	14 -8	16 -4
16-6=		
17-3=	17 -7	14 -6
15-8=		

123

SUBTRACT. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. CLEAR ONE-BY-ONE. WRITE THE ANSWER.

18-9=	17 -9	16 -8
15-7=		
17-5=	15 -6	18 -5
18-7=		
16-9=	17 -6	15 -8
17-8=		
18-6=	16 -6	18 -3
16-7=		
15-9=	17 -7	18 -4
18-8=		

124

DO EACH EXAMPLE. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. WRITE THE ANSWER.

16-7=	19 -7	14 -9
19-8=		
12-5=	13 -9	19 -5
19-6=		
13-7=	14 -5	16 -9
18-9=		
14-8=	13 -4	18 -7
13-7=		
17-9=	19 -9	19 -4
19-4=		

125

OBJECTIVE 87

The pupil practices and memorizes basic addition and subtraction facts.

Class Activity 87 Internalization Drill:

Materials: All previous addition and subtraction facts cards with which the class still appears insecure.

Encourage the pupils to try to do the arithmetic in their heads. Do *not* allow too much time between cards. We are looking for the child's immediate response. If time allows, go through the cards twice, once visually and once orally. Have everyone sit on the right hand.

I'M GOING TO HOLD UP A CARD. IF YOU KNOW THE ANSWER, RAISE YOUR LEFT HAND AND I'LL CALL ON YOU FOR THE ANSWER.

OBJECTIVE 88

The pupil can correctly complete arithmetic exercises involving either addition or subtraction.

Direct pressing to 19 and clearing from 19 by 1s.

Warm-up

Board:

$19 - 7 = _$
$9 + 9 = _$

Book Activity 88A (page 126)

Using the two board examples, discuss with the class the fact that you are mixing addition and subtraction examples. After helping the class with the first set of four examples, allow them to do succeeding sets of four examples by themselves. Check their work.

This activity is designed to gauge the degree of proficiency achieved by each student. The results of work on this page should be recorded.

Book Activity 88B (page 127)

DO EACH EXAMPLE. DIRECT PRESS THE FIRST NUMBER. ALL OTHER NUMBERS MUST BE ADDED OR SUBTRACTED ONE BY ONE.

18-9=	9 +9	17 -9
7+8=		
9+8=	11 -5	9 +6
16-8=		
5+9=	17 -8	8 +4
15-6=		
7+5=	18 -9	8 +8
14-8=		
12-7=	16 -9	6 +9
7+3=		

126

SUBTRACT. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. CLEAR ONE-BY-ONE. WRITE THE ANSWER.

17-7=	15 -7	14 -8
15-9=		
14-7=	16 -6	15 -5
18-9=		
15-8=	17 -8	14 -6
16-9=		
15-6=	16 -8	18 -8
14-9=		
16-7=	17 -9	14 -5
19-9=		

127

OBJECTIVE 89

The pupil can correctly complete arithmetic exercises involving both addition and subtraction.

Warm-up Direct pressing to 19 and clearing from 19 by 1s.

Book Activity 89 (page 128) Board:

19 – 7 + 6 = __
9 + 8 – 7 = __
14 – 9 + 8 = __

Have volunteers come to the board and verbalize as they fingerpress the examples. For the first example on the board, the words might be: Press nineteen. Clear seven. Press six (or) Add nineteen. Subtract seven. Add six. Now turn to page 128. Do each of the other examples with the class, first having individual pupils verbalize and press the example. Then have the entire class verbalize, press, and write the answers for all the examples.

DO EACH EXAMPLE. DIRECT PRESS THE FIRST NUMBER IF YOU CAN. WRITE THE ANSWER.

19-8+7=	7+9-6=
4+7-9=	15-9+9=
7+6-4=	3+6-8=
17-9+6=	8+9-7=
5+8-7=	13-6+8=
18-7-6=	2+6-4=
9+7-8=	19-7+4=
14-9+4=	18-6+9=
16-7+9=	1+7-5=
6+5-7=	12-8+9=

128

unit

18

Counting and Pressing to 99

Basal Reference

1. Place value.
2. Rote counting to 99.
3. Counting objects to 99.

Fingermath Prerequisites

Units 1 through 11

*Objective 90 (TE page 221)**

The pupil can identify and direct press 10s and 1s in the same press and can compare a hand-press picture to a set representation or a numeral.

Book Activity 90A (page 129)**
Book Activity 90B (page 130)
Book Activity 90C (page 131)
Book Activity 90D (page 132)

Objective 91 (TE page 225)

The pupil can count to 49 and back by 1s.

Class Activity 91

Objective 92 (TE page 226)

The pupil can make the 49 to 50 and the 50 to 49 exchanges.

Book Activity 92A (page 133)
Book Activity 92B (page 134)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 90

The pupil can identify and direct press 10s and 1s in the same press and can compare a hand-press picture to a set representation or a numeral.

Synopsis

The pupil has already experienced pressing numbers on both hands (Units 11, 13, 14, 16, 17). This objective extends this skill to numbers up to 99.

Warm-up

Direct pressing by 10s to 90; direct pressing all numbers to 19.

Materials: Nine bundles of ten sticks each, one bundle of five sticks, and four single sticks.

Book Activity 90A
(page 129)

Begin by reviewing the numbers 10 through 19. Have the students press each of the ten numbers, while you say TEN AND THREE MORE, for example, and hold up the appropriate group of sticks. Go through the numbers 10 to 19. Next hold up four bundles of ten and ask HOW MANY STICKS? Have the class press four 10s. Then add three single sticks and have the students press three 1s. Then ask the class HOW MANY IN ALL? Forty-three (or) Forty and three. Follow the same procedure with single sticks and bundles of five and ten totaling 36, 49, 27, 53, 78, 83, 92, and 58.

Now turn to page 129. Do the first two examples with the class. Ask them to press each example on their fingers before they color in the corresponding fingers in the book.

Warm-up

Direct pressing by 10s to 90; direct pressing all numbers to 19.

Book Activity 90B
(page 130)

Begin by having the class direct press numbers as follows:

PRESS SIX TENS. READ YOUR FINGERS. Sixty. PRESS NINE ONES. READ YOUR FINGERS. Sixty-nine. CLEAR YOUR FINGERS.

PRESS TWO TENS. . . . PRESS SEVEN ONES. . . .
PRESS EIGHT TENS. . . . PRESS THREE ONES. . . .
PRESS NINE TENS. . . . PRESS FIVE ONES. . . .
PRESS SEVEN TENS. . . . PRESS ONE ONE. . . .
PRESS THREE TENS. . . . PRESS FOUR ONES. . . .
PRESS FIVE TENS. . . . PRESS SIX ONES. . . .
PRESS ONE TEN. . . . PRESS TWO ONES. . . .
PRESS FOUR TENS. . . . PRESS EIGHT ONES. . . .
PRESS SEVEN TENS. . . . PRESS SEVEN ONES. . . .

Then have them open their books to page 130. This activity is the reverse of the previous one. Here the pupil is to circle the correct number of single sticks and stick bundles. Ask the class to press each example before circling the sticks.

Warm-up

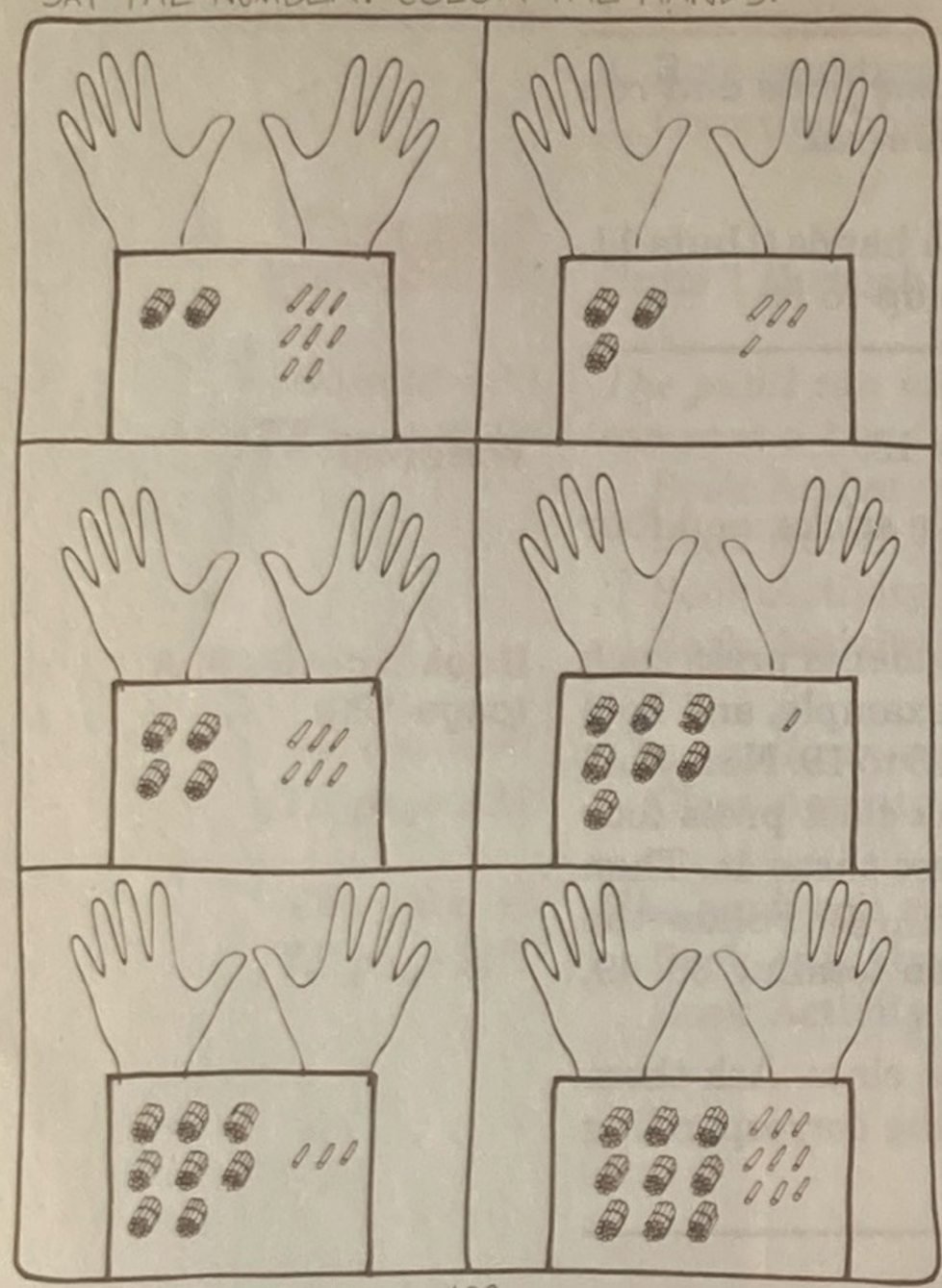
Direct pressing to 99.

Book Activity 90C
(page 131)

This activity and the one that follows link hand pictures to numerals.

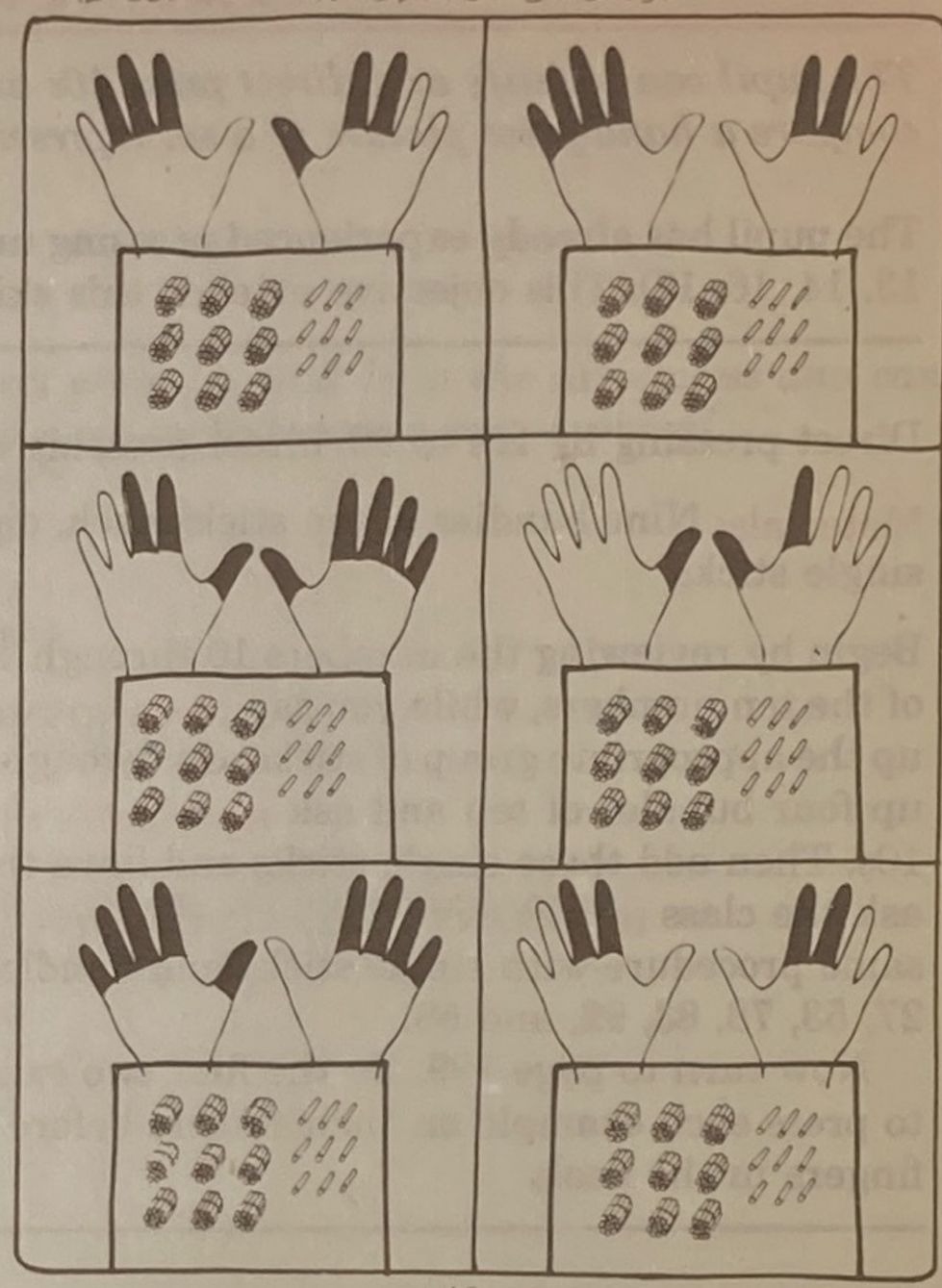
PRESS SIX TENS AND FIVE ONES. READ YOUR FINGERS. . . . CLEAR YOUR FINGERS.
PRESS FOUR TENS AND NO ONES. . . .
PRESS SEVEN TENS AND TWO ONES. . . .
PRESS TWO TENS AND SEVEN ONES. . . .
PRESS EIGHT TENS AND FOUR ONES. . . .
PRESS FIVE TENS AND SIX ONES. . . .

PRESS THE NUMBER OF STICKS SHOWN.
SAY THE NUMBER. COLOR THE HANDS.



129

PRESS YOUR HANDS AS SHOWN. CIRCLE
THE CORRECT NUMBER OF STICKS.



130

PRESS ONE TEN AND NINE ONES. . . .
PRESS NINE TENS AND THREE ONES. . . .
PRESS THREE TENS AND EIGHT ONES. . . .
PRESS SIX TENS AND ONE ONE. . . .

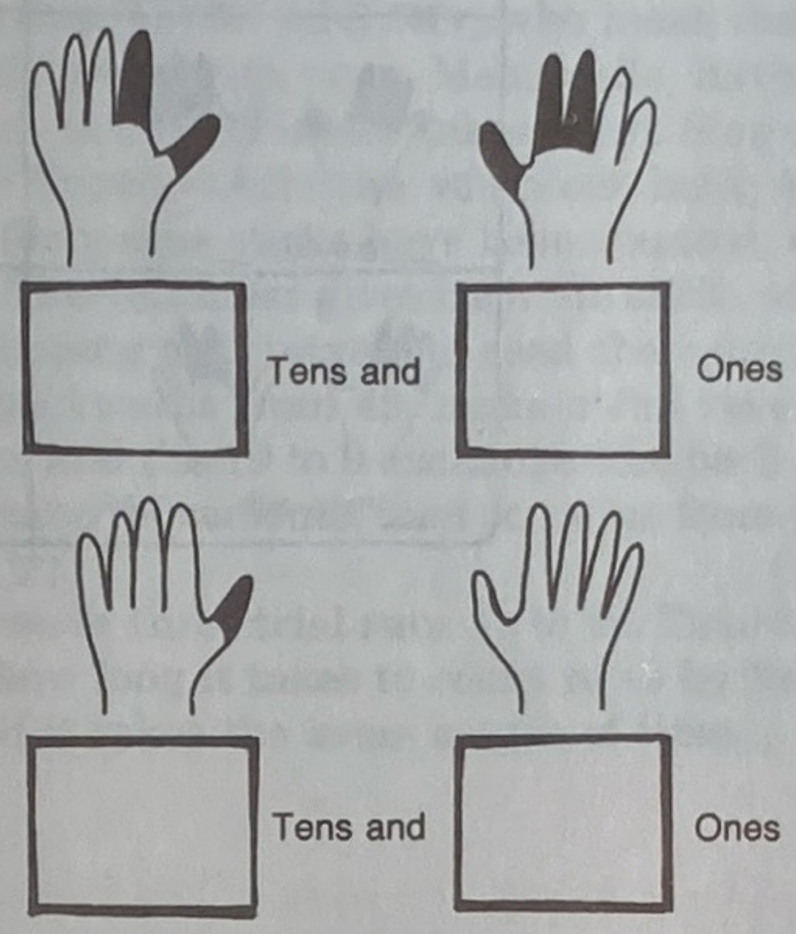
Now have the class turn to page 131. Help them with the first two exercises, then let them continue by themselves.

Direct pressing to 99.

Warm-up

Board:

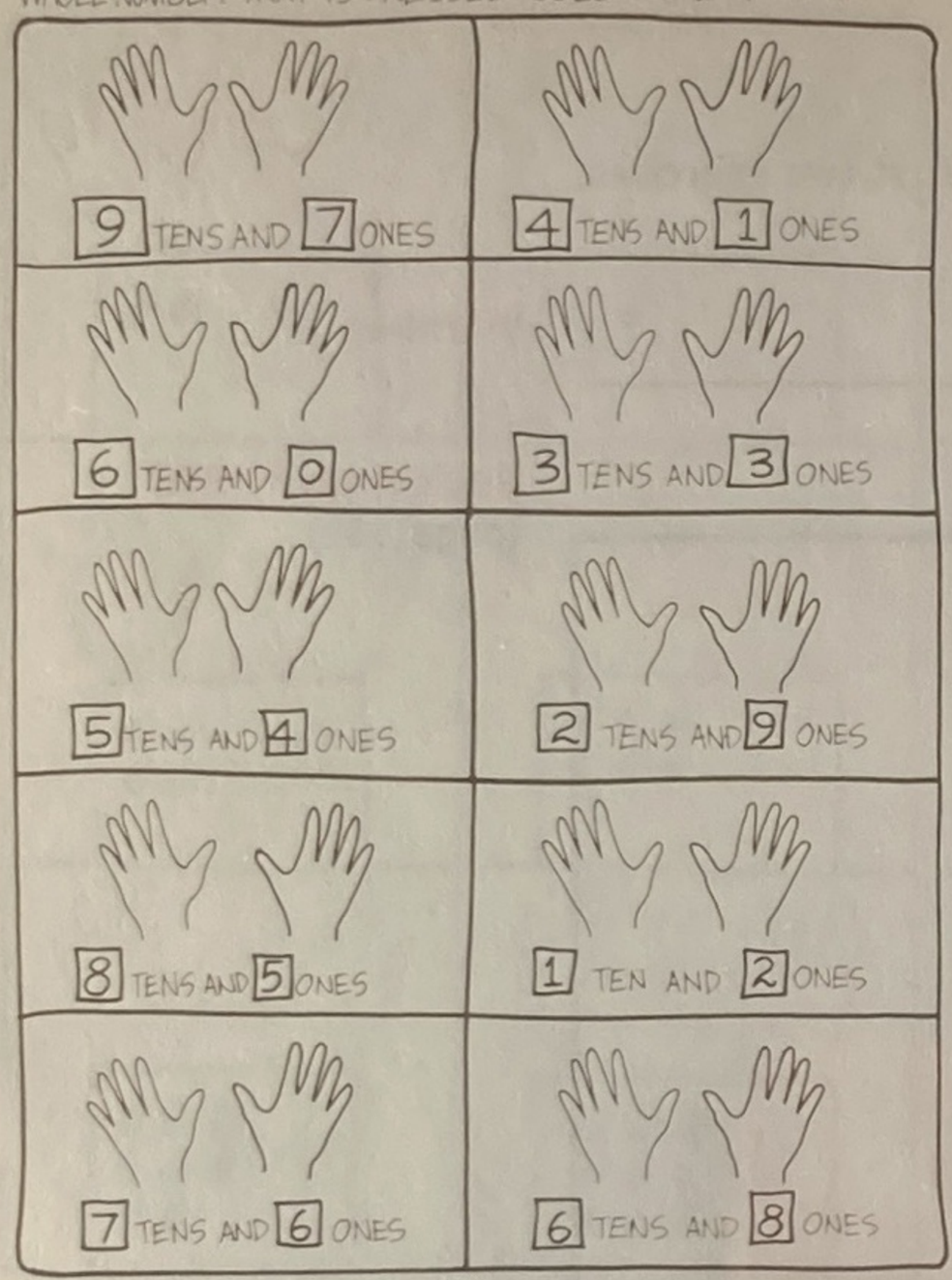
Book Activity 90D (page 132)



Have volunteers do these first two. Make sure that they verbalize the hand picture as six 10s and seven 1s before they write the appropriate numerals in the boxes.

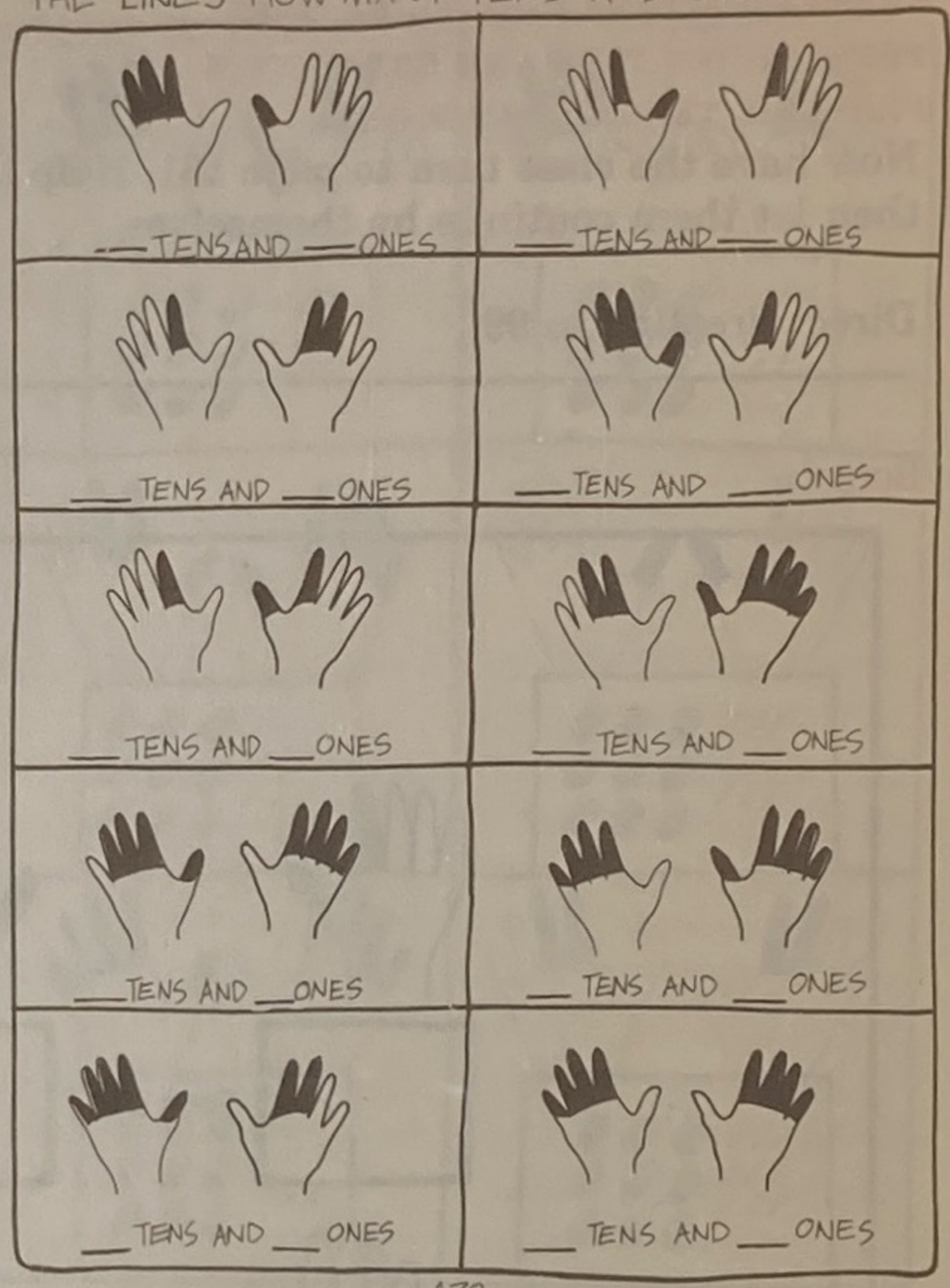
In the second example stress the importance of saying five 10s and *no* 1s (or) *zero* ones rather than leaving the ones box blank. Then have the class turn to page 132.

PRESS THE NUMBER OF TENS AND ONES SHOWN. SAY THE WHOLE NUMBER THAT IS PRESSED. COLOR THE HANDS.



131

PRESS YOUR HANDS AS SHOWN. WRITE ON THE LINES HOW MANY TENS AND ONES.



132

OBJECTIVE 91

The pupil can count to 49 and back by 1s.

Synopsis

There are two reasons for counting only to 49 in this objective. First, the count to 99 is a long and not necessarily useful activity to do all at once. Second, the 49 to 50 exchange involves special hand motions that require separate treatment. It is important that the count be made backwards as well as forwards so that equal practice is given to both operations. In addition, the pupil is thereby helped to see the relationship of the inverse operations.

Class Activity 91

Materials: A table set up in the front of the room with forty-nine counting sticks on it and at least four pieces of yarn to bind the sticks together.
Call for a pupil to come and take the counting sticks as you count them out. Slide them one at a time to the volunteer, who takes them and groups them by tens and ties each group with yarn. Meanwhile, have the class count the sticks on their fingers as the volunteer takes them. Stop occasionally to have the class read their fingers while the volunteer holds up the sticks so far collected. When all forty-nine sticks have been counted, the whole process is repeated in reverse. The volunteer gives back the sticks while the class counts backwards, again stopping at intervals to read their fingers.

Before counting backwards from 49, make a full review of the 5 to 4 exchange (the back flip) and the 10 to 9 exchange (the back hop). Practice these a few times, first as hand movements, then counting from 7 back to 4 and from 13 back to 7.

Finally, conduct two or three trial runs up to 49. Time the count in seconds, to get some idea of how long it takes to count to 49 by 1s. Do the same thing from 49 to 0 to see if it takes the same length of time.

OBJECTIVE 92

The pupil can make the 49 to 50 and the 50 to 49 exchanges.

Synopsis These are two more exchanges that add 1 or subtract 1. It is important that the children grasp the common feature of all exchanges so that they are able to make these exchanges.

Warm-up Count to 49 by 1s.

Book Activity 92A (page 133) Have the class press 49 and 50 alternately two or three times, clearing their fingers after each press.

PRESS FORTY-NINE. . . . CLEAR YOUR FINGERS.

PRESS FIFTY. . . . CLEAR YOUR FINGERS.

Next, have them press 49 and 50 repeatedly and alternately without clearing their fingers. PRESS FORTY-NINE. . . . ADD ONE. . . . READ YOUR FINGERS. . . . SUBTRACT ONE. . . . READ YOUR FINGERS. . . . ADD ONE. . . .

Now have the pupils press the following sums and differences, stopping if necessary at the 49 to 50 or the 50 to 49 exchange to think about what they are to do. Tell the class in each case to direct press the first number in each example and press or clear the second number by 1s.

PRESS FORTY-EIGHT. ADD TWO. READ YOUR FINGERS. . . . CLEAR YOUR FINGERS.

PRESS FORTY-SEVEN. ADD FOUR.

PRESS FORTY-FIVE. ADD SIX.

PRESS FORTY-NINE. ADD FOUR.

PRESS FIFTY-ONE. CLEAR TWO.

PRESS FIFTY-THREE. CLEAR FOUR.

PRESS FORTY-EIGHT. ADD FIVE.

PRESS FIFTY-FOUR. CLEAR SEVEN.

PRESS FORTY-SIX. ADD SEVEN.

Now have the class open their books to page 133. Do the first few examples with the class.

Warm-up Count by 1s to 55 and clear back to 0.

Book Activity 92B (page 134) This activity is designed as a review.

DO EACH EXAMPLE. DIRECT PRESS THE FIRST NUMBER.
ALL OTHER NUMBERS MUST BE ADDED OR SUBTRACTED ONE-BY ONE.

49+3=	51-4=
54-7=	46+7=
46+8=	49+5=
53-6=	54-8=
52-5=	51-5=
48+9=	42+9=
47+9=	51-9=
57-8=	44+8=
44+9=	52-8=
56-8=	55-8=

133

DO EACH EXAMPLE DIRECT PRESS THE FIRST NUMBER
ALL THE OTHER NUMBERS MUST BE ADDED OR
SUBTRACTED ONE-BY ONE

45+7=	44+7=
47+4=	54-9=
53-7=	47+6=
49+6=	52-7=
55-7=	49+4=
45+6=	52-9=
54-9=	48-6=
48+7=	55-6=
58-9=	53-8=
48+4=	51-7=

134

unit

19

Adding and Subtracting to and from 99

Basal Reference

1. Counting to 99.
2. Sums and differences to and from 99 without regrouping.
3. Using counters to add and subtract to and from 99.

Fingermath Prerequisites

Units 1 through 14, 16 and 18
Note: If your class needs more time on the development of fundamental skills, skip this unit and review more basic materials.

*Objective 93 (TE page 231)**

The pupil can add 2 two-place numbers to 99 without decimal regrouping in the units or tens position.
Book Activity 93A (page 135)**
Book Activity 93B (page 136)

Objective 94 (TE page 233)

The pupil can subtract 2 two-place numbers with minuends up to 99 without decimal regrouping in the units or tens position.
Book Activity 94A (page 137)
Book Activity 94B (page 138)

Objective 95 (TE page 235)

The pupil can add 2 two-place numbers to 99 with regrouping.
Book Activity 95 (page 139)

Objective 96 (TE page 237)

The pupil can subtract 2 two-place numbers with minuends to 99 with regrouping.
Book Activity 96 (page 140)

Objective 97 (TE page 238)

The pupil can add and subtract any 2 two-place numbers.
Book Activity 97 (page 141)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

OBJECTIVE 93

The pupil can add 2 two-place numbers to 99 without decimal regrouping in the units or tens position.

Direct pressing to 99; 49 to 50 exchange.

Warm-up

Book Activity 93A
(page 135)

Board:

TENS	ONES

Materials: Enough counting sticks to make nine groups of ten sticks each, one group of five sticks each, and eight single sticks. The groups of ten are bound with yarn of one color, the group of five with another color.
Have the class open their books to page 135.

Have one child come to the front and stand with his or her back to the class and hold up high two bundles of ten in the left hand and one single stick in the right hand. Write the amount as you say TWO TENS AND ONE ONE in the spaces on the place-value form on the board.

TENS	ONES
2	1

Have the class direct press two 10s and one 1.

READ YOUR FINGERS. Twenty one. Have a second pupil come to the front, stand with his or her back to the class, and hold up high two single sticks in the right hand. Write this amount under the ones column as you say ADD TWO ONES. Two. READ YOUR FINGERS. Twenty-three. Write the answer in the proper place. Ask the child with two sticks to place them in the right hand of the first child. NOW, YOU HAVE TWENTY-THREE STICKS—ALTOGETHER.

Follow this pattern for the rest of the examples on the page, letting individual pupils take turns in coming up front, facing the board, and acting as class leaders. While the leader holds up bundles, verbalizes the quantities, and writes them on the board, the class presses the sums and writes their answers in their books.

Note that the first three examples add 1s only, the next three add 10s only, and then the examples include both 1s and 10s in the second addend.

Warm-up Direct pressing to 99; 49 to 50 exchange.

Book Activity 93B (page 136) Board:

TENS	ONES
4	8
+3	3

Demonstrate the example at the board, pressing and verbalizing. Do not use counting sticks but refer to them during demonstration. Then have the class turn to page 136 and work the exercises.

OBJECTIVE 94

The pupil can subtract 2 two-place numbers with minuends up to 99 without regrouping in the units or tens position.

Direct pressing to 99; clearing from 50.

Warm-up

Book Activity 94A
(page 137)

Board:

TENS	ONES

Materials: Enough counting sticks to make nine groups of ten sticks each, two groups of five sticks each, and eight single sticks. The groups of ten are bound with yarn of one color, the groups of five with another color. Have the class open their books to page 137. Ask one child to come to the front, stand with his or her back to the class, and hold up high four tens bundles in the left hand and eight single sticks in the right. As you say FOUR TENS AND EIGHT ONES, write the amount in the spaces on the place-value form on the board.

TENS	ONES
4	8

Have the class direct press four 10s and eight 1s. READ YOUR FINGERS. Forty-eight.

Have a second pupil come to the front and take three 10s and five 1s away from the first pupil and hold them up high, while you write the amount subtracted underneath the first number. EVERYONE SUBTRACT THREE TENS AND FIVE ONES. READ YOUR FINGERS. Thirteen. Write 13 in the space under the line.

Follow this pattern for the rest of the examples on the page, letting individual pupils take turns in coming to the board and acting as class leaders. While the leader holds up bundles, verbalizes the quantities, and writes them on the board, the class presses the sums and writes their answers in their books.

Note that the first three examples subtract 1s only, the next three subtract 10s only, and then the examples include both 1s and 10s in the subtrahend.

Direct pressing to 99; clearing from 50.

Warm-up

Book Activity 94B
(page 138)

Board:

TENS	ONES
–8	4
–3	2

Ask a volunteer to do the example at the board, pressing and verbalizing. Then have the class turn to page 138 and work the exercises.

SUBTRACT THE ONES. SUBTRACT THE TENS. READ THE ANSWER. PRESS THE WHOLE ANSWER.

TENS	ONES
7	6
−	4

TENS	ONES
5	8
−	7

TENS	ONES
4	6
−	6

TENS	ONES
6	7
−4	0

TENS	ONES
4	3
−3	0

TENS	ONES
8	7
−2	0

TENS	ONES
7	7
−3	6

TENS	ONES
4	9
−2	7

TENS	ONES
3	8
−1	6

TENS	ONES
4	8
−4	7

TENS	ONES
7	4
−1	3

TENS	ONES
3	9
−2	9

TENS	ONES
9	9
−8	3

TENS	ONES
4	7
−2	4

TENS	ONES
8	4
−7	4

TENS	ONES
2	4
−1	2

TENS	ONES
3	8
−2	1

TENS	ONES
5	4
+5	1

137

SUBTRACT THE ONES. SUBTRACT THE TENS. READ THE ANSWER. PRESS THE WHOLE ANSWER.

TENS	ONES
8	7
−5	6

TENS	ONES
9	7
−8	5

TENS	ONES
7	2
−5	0

TENS	ONES
4	3
−2	3

TENS	ONES
5	7
−3	6

TENS	ONES
3	8
−2	4

TENS	ONES
2	8
−1	4

TENS	ONES
7	3
−4	1

TENS	ONES
5	7
−4	6

TENS	ONES
8	8
−5	5

TENS	ONES
2	7
−	6

TENS	ONES
7	6
−3	4

TENS	ONES
6	8
−4	3

TENS	ONES
4	3
−	2

TENS	ONES
5	6
−4	2

TENS	ONES
3	5
−1	4

TENS	ONES
7	6
−6	3

TENS	ONES
6	4
−2	3

138

OBJECTIVE 95

The pupil can add 2 two-place numbers to 99 with regrouping.

Synopsis

One of the advantages of Fingermath is that the pupil can easily add numbers that normally require regrouping before regrouping has been taught as a special procedure.

Warm-up

Counting to 90 by 1s and by 10s; 49 to 50 exchange.

Book Activity 95 (page 139)

TENS	ONES
3	4
+	6

TENS	ONES
3	5
+2	8

TENS	ONES
2	3
+2	9

TENS	ONES
4	8
+3	9

TENS	ONES
4	7
+	5

TENS	ONES
5	9
+2	9

Future regrouping procedures will require adding the units column before the tens column. Ask the class to add the units portion first as a preparatory discipline.

Have individual pupils come to the board and demonstrate each addition by fingerpressing and verbalizing. Then have the class open their books to page 139 and work through the examples. Note that the last twelve examples require a 49 to 50 or a 40 to 50 exchange. If your class is having difficulty with these exchanges, you may wish to practice them before assigning the exercises.

PRESS THE WHOLE TOP NUMBER. ADD THE WHOLE BOTTOM NUMBER. READ YOUR FINGERS. WRITE DOWN HOW MANY TENS AND HOW MANY ONES.

TENS	ONES
3	6
+	8

TENS	ONES
2	5
+3	6

TENS	ONES
5	4
+2	8

TENS	ONES
5	4
+2	8

TENS	ONES
3	6
+4	7

TENS	ONES
6	7
+2	8

TENS	ONES
3	2
+1	9

TENS	ONES
7	5
+1	5

TENS	ONES
8	4
+3	9

TENS	ONES
4	7
+3	9

TENS	ONES
4	3
+	9

TENS	ONES
3	8
+1	4

TENS	ONES
1	9
+3	8

TENS	ONES
4	3
+	8

TENS	ONES
2	8
+2	9

TENS	ONES
3	0
+2	0

TENS	ONES
2	6
+2	7

TENS	ONES
1	8
+3	4

139

OBJECTIVE 96

The pupil can subtract 2 two-place numbers with minuends to 99 with regrouping.

Synopsis

As with addition, Fingermath makes it possible for the pupil to subtract numbers that normally require regrouping before regrouping has been taught as a procedure.

Warm-up

Clearing from 99 by 1s.

TENS	ONES
3	2
–	5

TENS	ONES
2	3
–1	9

TENS	ONES
6	4
–1	7

TENS	ONES
7	4
–	7

TENS	ONES
5	3
–	7

TENS	ONES
7	0
–2	9

Book Activity 96
(page 140)

Make sure that pupils are making the 50 to 49 exchange smoothly.

As with addition, the pupil needs to subtract the units before the 10s to introduce the rule as a preparation for learning the regrouping procedure.

Have volunteers come to the board to demonstrate each subtraction with verbalization. Then have the class open their books to page 140 and work through the examples. Note that the last twelve examples require a 50 to 49 or a 50 to 40 exchange.

PRESS THE WHOLE TOP NUMBER. SUBTRACT THE WHOLE BOTTOM NUMBER. READ YOUR FINGERS. WRITE DOWN HOW MANY TENS AND HOW MANY ONES.

TENS	ONES
3	2
−	8

TENS	ONES
4	3
−1	7

TENS	ONES
8	7
−7	9

TENS	ONES
4	2
−3	7

TENS	ONES
2	8
−1	9

TENS	ONES
7	0
−4	9

TENS	ONES
4	0
−2	7

TENS	ONES
3	4
−1	9

TENS	ONES
8	0
−5	7

TENS	ONES
5	3
−	7

TENS	ONES
5	6
−	9

TENS	ONES
6	3
−1	7

TENS	ONES
9	2
−4	4

TENS	ONES
7	6
−3	7

TENS	ONES
8	1
−3	9

TENS	ONES
6	2
−1	9

TENS	ONES
7	0
−2	3

TENS	ONES
8	4
−3	5

140

OBJECTIVE 97

The pupil can add and subtract any 2 two-place numbers.

Counting to and clearing from 99 by 1s.

Warm-up

Board:

38 +17	53 −28	43 + 7	53 − 8

Book Activity 97
(page 141)

Before starting this activity point out that both sums and differences are included. Have the class notice also that the place-value form has been eliminated.

Have volunteers come to the board to verbalize and press each example. Then ask the class to work through page 141.

ADD OR SUBTRACT EACH EXAMPLE, AS SHOWN.

73 −17	54 +28	43 +28	73 −47	55 +28	76 −69
40 −29	28 +64	39 +49	72 −38	93 −49	28 +26
38 +27	56 −14	60 −28	26 +48	48 +49	76 −68
43 +39	20 −9	24 +27	17 +18	53 −17	78 78 +14
76 −28	67 −19	84 −39	27 +47	50 −13	63 +24
50 −27	81 −34	23 +28	68 −49	17 +32	52 +31

141

unit

20

Counting by 3s and 5s

Basal Reference While counting of 3s is not traditionally included in primary basal texts, the nature of Fingermath makes this activity practical for more capable pupils.

Fingermath Prerequisites Units 1 through 7, 10, 11, 15, 19

*Objective 98 (TE page 243)** *The pupil can count and fingerpress numbers by 3s.*
Book Activity 98A (page 142)**
Book Activity 98B (page 143)
Book Activity 98C (page 144)

Objective 99 (TE page 246) *The pupil can count and fingerpress numbers by 5s.*
Book Activity 99A (page 145)
Book Activity 99B (page 146)
Book Activity 99C (page 147)

*TE page numbers are those which are in this Teacher's Edition.
**Book Activity page numbers refer to the Pupil's Book.

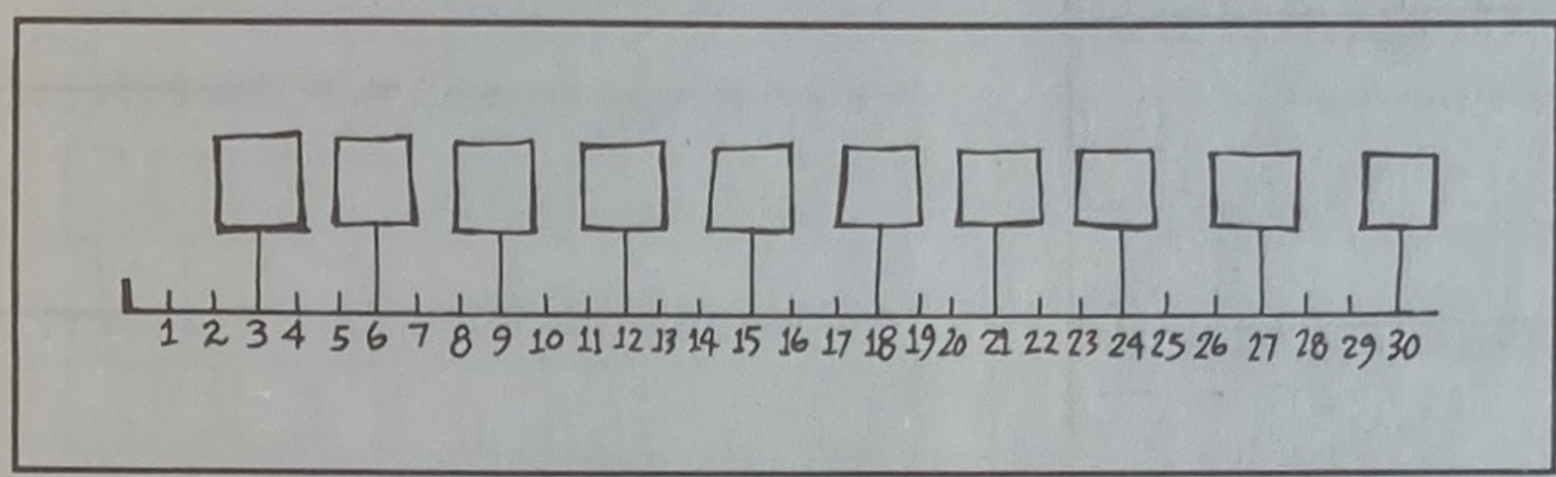
OBJECTIVE 98

The pupil can count and fingerpress numbers by 3s.

This continuation of skip-counting practices 2s and 3s. **Synopsis**

Skip-counting by 2s to 20; unit counting to 30; direct pressing to 30; exchanges to 30. **Warm-up**

Board: **Book Activity 98A** (page 142)



Begin by teaching the class to recite the following sequence while clapping their hands to the triple cadence. *One*-two-three, *two*-two-three, *three*-two-three, *four*-two-three, *five*-two-three, *six*-two-three, *seven*-two-three, *eight*-two-three, *nine*-two-three, *ten*-two-three. Have individual pupils lead the class in verbalizing and clapping.

After practicing the skip-count this way, have them practice the 3s skip-count cadence while fingerpressing from 1 to 30. This should be done very slowly.

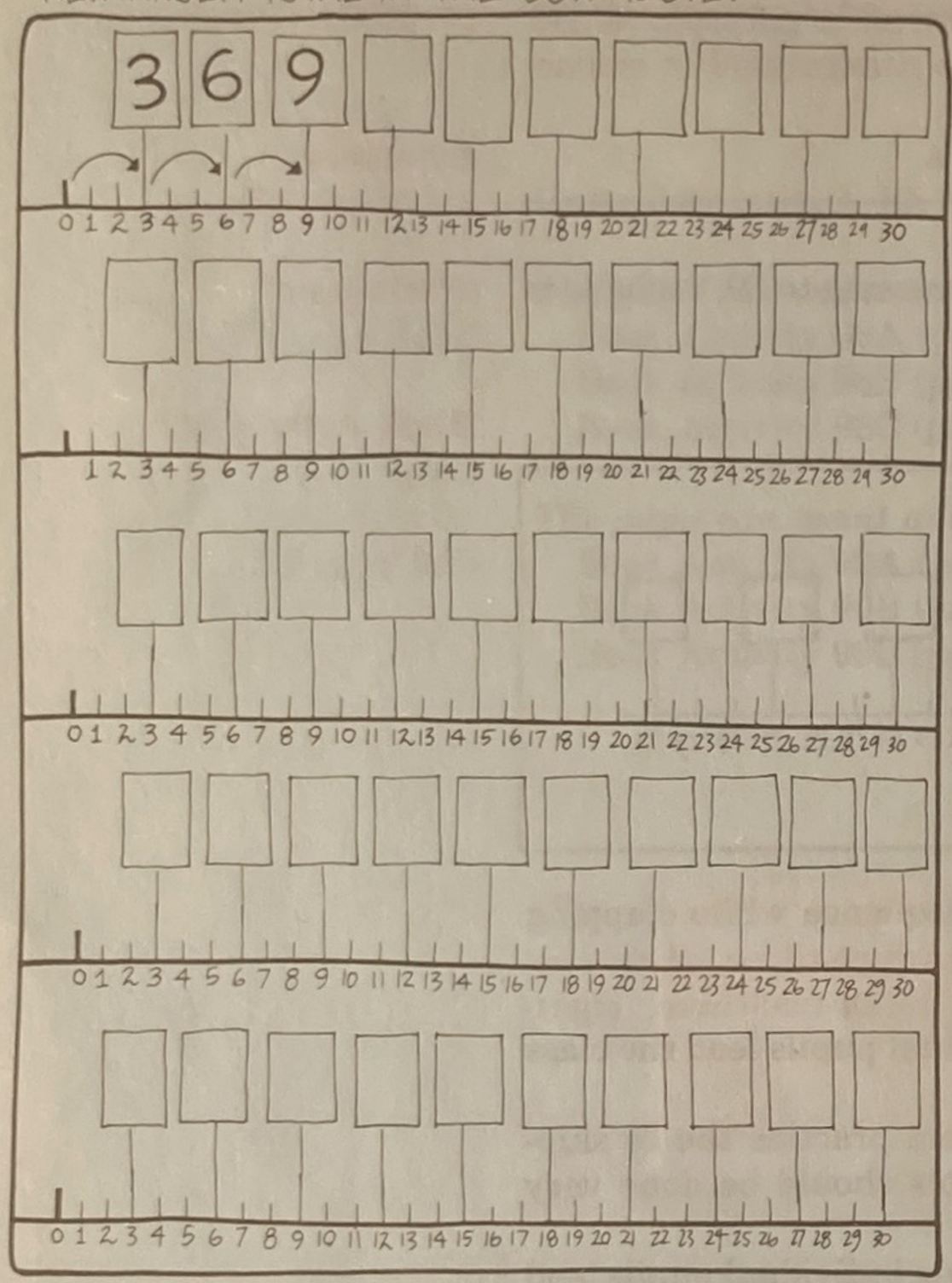
Practice skip-counting while fingerpressing by having individual pupils lead the class and verbalizing. Next have two children come to the board. While one slowly skip-counts, the other draws the corresponding skip loops, speaks the numbers as they are reached, and writes them in the boxes.

Then have class turn to page 142 and pair off. Let each pupil practice each role five times.

Skip-counting by 2s and 3s. **Warm-up**

Have the class turn to page 143. Pair off the pupils and have them take two turns each at the 2s number line and four turns each at the 3s number line. **Book Activity 98B** (page 143)

COUNT THREES. DRAW EACH LOOP. WRITE EACH NEW FINGER TOTAL IN THE BOX ABOVE.



142

Warm-up Skip-counting by 2s and 3s.

Book Activity 98C (page 144) Board:

THREES TABLE

1 Three	
2 Threes	
3 Threes	
4 Threes	
5 Threes	
6 Threes	
7 Threes	
8 Threes	
9 Threes	
10 Threes	

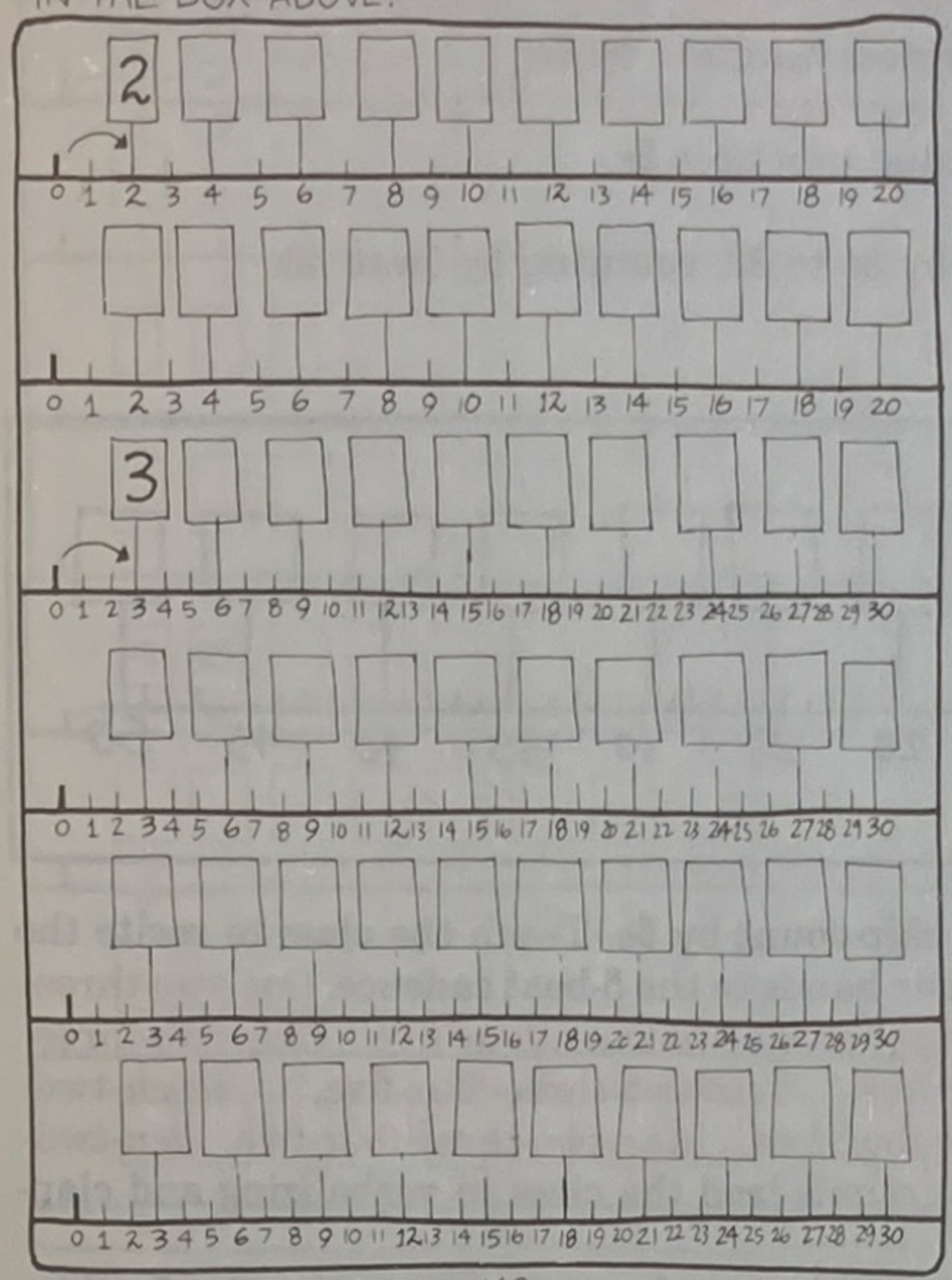
Two 3s = __
Four 3s = __
Six 2s = __
Five 3s = __

Have volunteers come to the board and fill in the threes table.

Next, call on individual pupils to skip-count and verbalize threes table facts randomly selected by you. Have the class open books to page 144.

Point out that you have mixed twos table and threes table facts. Do the first four examples at the board to make certain that the pupils understand how to count by each factor.

COUNT TWO'S OR THREES, AS SHOWN. DRAW EACH LOOP. WRITE EACH NEW FINGER TOTAL IN THE BOX ABOVE.



COUNT BY TWOS OR THREES, AS SHOWN. WRITE THE TOTAL.

2 THREES =	10 TWOS =
4 THREES =	1 TWO =
6 TWOS =	8 THREES =
5 THREES =	4 TWOS =
8 TWOS =	7 THREES =
3 TWOS =	9 THREES =
1 THREE =	9 TWOS =
7 TWOS =	3 THREES =
6 THREES =	2 TWOS =
10 THREES =	5 TWOS =

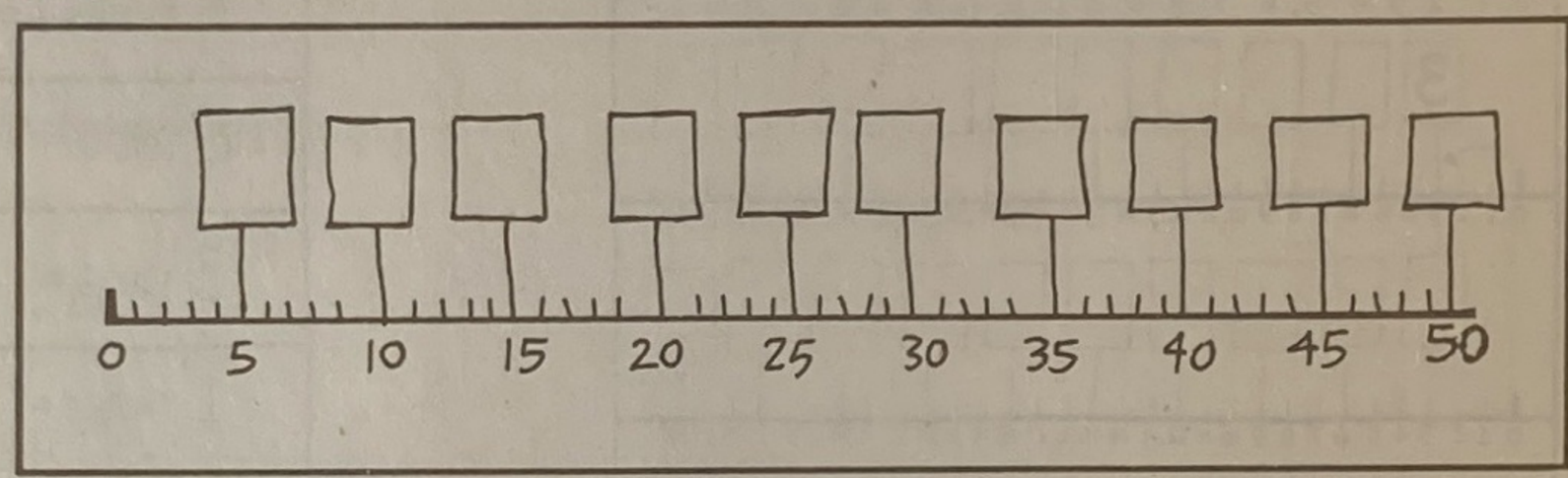
OBJECTIVE 99

The pupil can count and fingerpress numbers by 5s.

Synopsis This continuation of skip-counting practices 5s.

Warm-up Skip-counting by 2s to 20 and by 3s to 30; counting by 1s to 50.

Book Activity 99A (page 145) Board:



Begin by teaching the class to skip-count by 5s. Teach the class to recite the following sequence, clapping their hands to the 5-beat cadence. *One*-two-three-four-five, *two*-two-three-four-five, *three*-two-three-four-five, *four*-two-three-four-five, *five*-two-three-four-five, *six*-two-three-four-five, *seven*-two-three-four-five, *eight*-two-three-four-five, *nine*-two-three-four-five, *ten*-two-three-four-five. Have individual pupils lead the class in verbalizing and clapping the cadence.

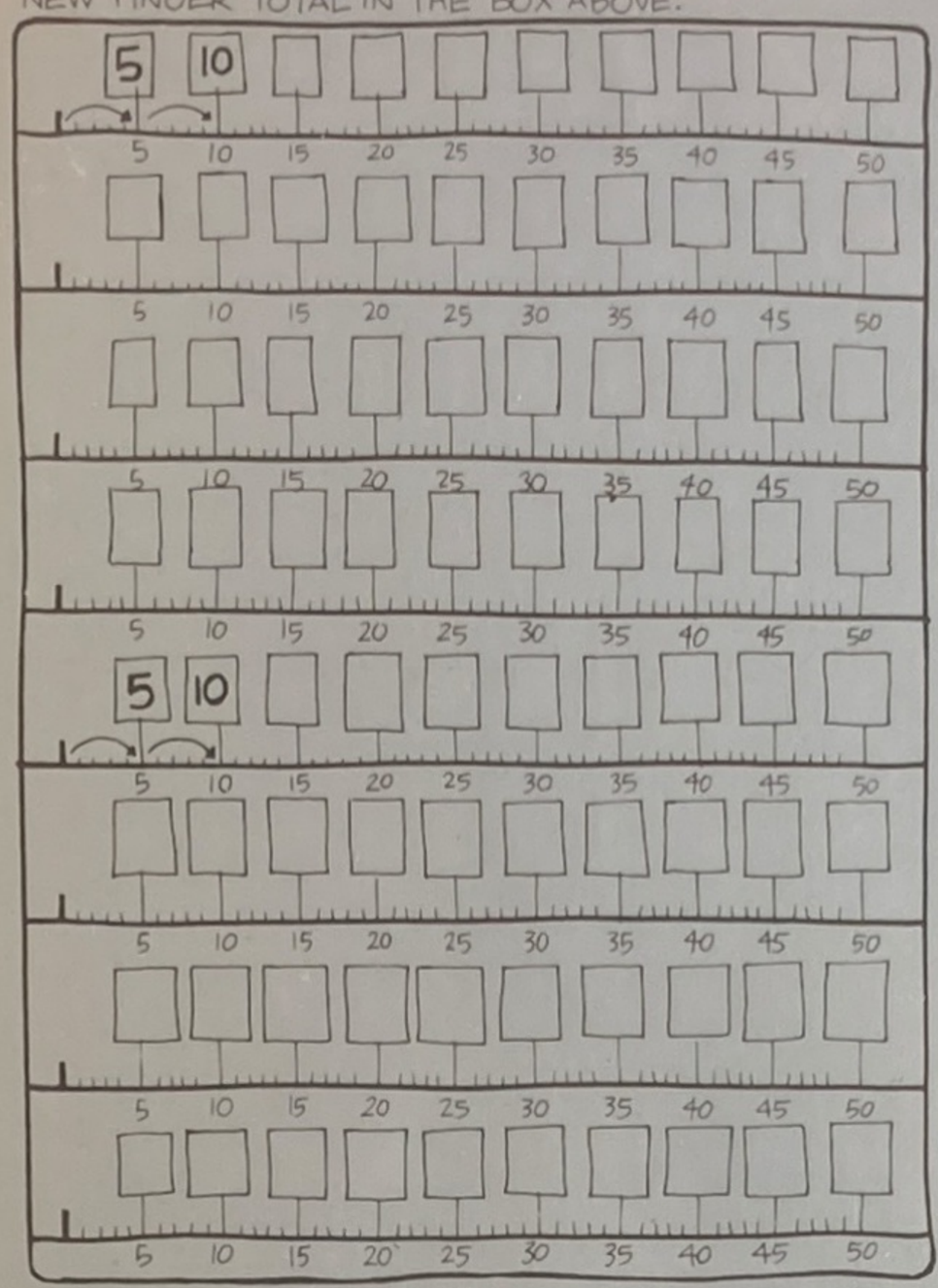
After practicing the skip-count this way, have them practice the 5s skip-count cadence while fingerpressing from 1 to 50. This should be done very slowly. Practice this way of skip-counting while fingerpressing by having individual pupils lead the class by verbalizing. Next have two children come to the board. While one slowly skip-counts the other draws the corresponding skip loops, speaks the numbers as they are reached (five, ten, fifteen, twenty, and so forth), and writes them in the boxes above the line.

Then have the class turn to page 145 and pair off. Let each child repeat each role four times.

Warm-up Skip-counting by 2s, 3s, and 5s.

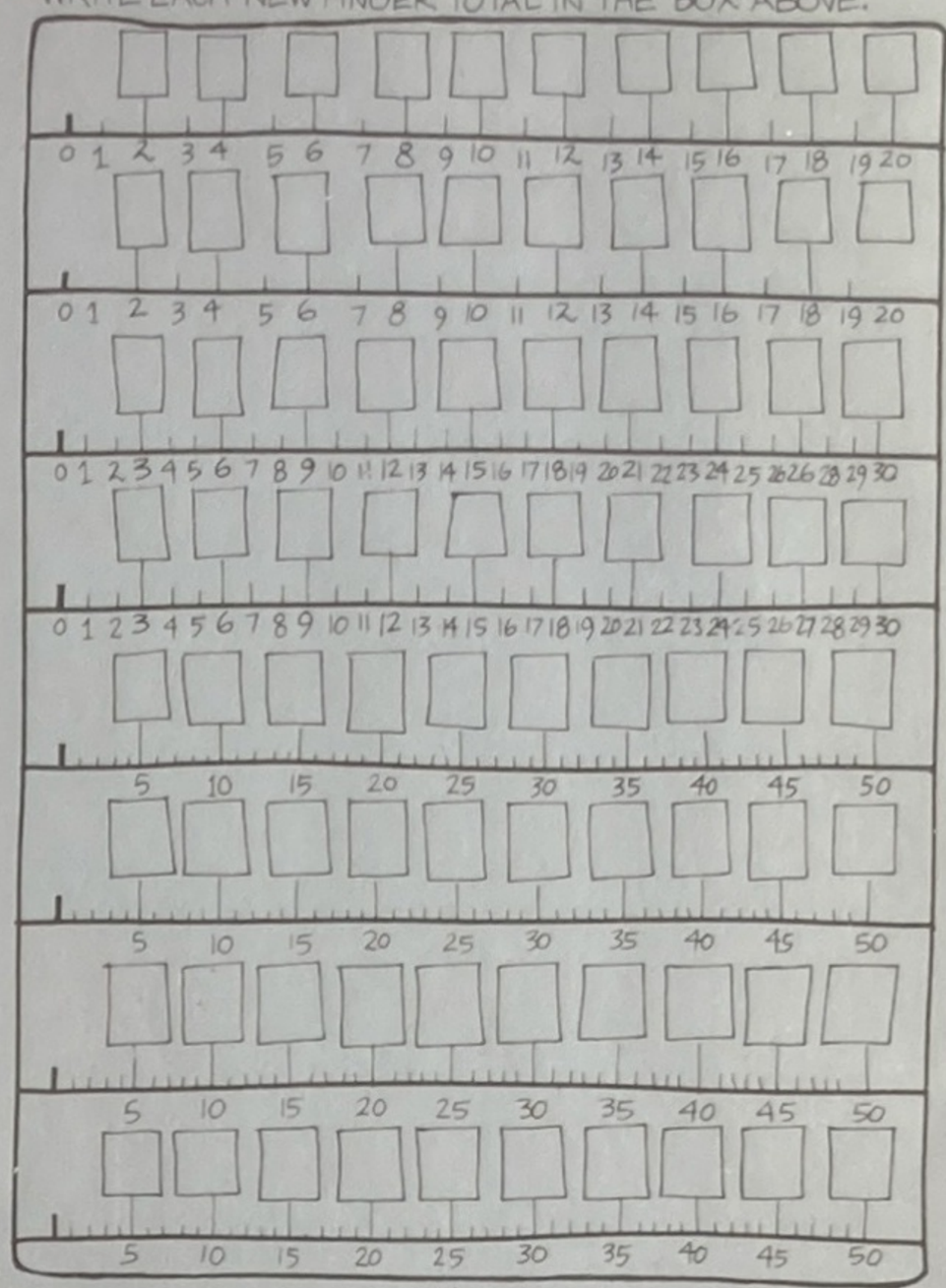
Book Activity 99B (page 146) Have the class turn to page 146. Pair off pupils and have them take two turns each at the 2s number line, two turns at the 3s number line and four turns each at the 5s number line, before reversing roles.

COUNT FIVES, AS SHOWN. DRAW EACH LOOP. WRITE EACH NEW FINGER TOTAL IN THE BOX ABOVE.



145

COUNT TWOS, THREES OR FIVES, AS SHOWN. DRAW EACH LOOP. WRITE EACH NEW FINGER TOTAL IN THE BOX ABOVE.



146

Skip-counting by 2s, 3s, and 5s.

Warm-up

Board:

Book Activity 99C
(page 147)

FIVES TABLE

1 Five	
2 Fives	
3 Fives	
4 Fives	
5 Fives	
6 Fives	
7 Fives	
8 Fives	
9 Fives	
10 Fives	

Three 5s = __
Seven 5s = __
Five 5s = __
Nine 5s = __

Have volunteers come to the board and fill in the fives table.

Next call on individual pupils to skip-count and verbalize fives table items randomly selected by you. Have the class open their books to page 147.

Point out that you have mixed twos, threes, and fives facts. Do the first four examples at the board to make certain that the pupils understand how to count by each of these three factors.

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